

ADVERBIAL ORDERING IN ENGLISH

by

Christina M. Yong

A thesis submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Linguistics

The University of Utah

August 2015

Copyright © Christina M. Yong 2015

All Rights Reserved

The University of Utah Graduate School

STATEMENT OF THESIS APPROVAL

The thesis of **Christina M. Yong**
has been approved by the following supervisory committee members:

<u>Aniko Csirmaz</u>	, Chair	<u>June 3, 2015</u> <small>Date Approved</small>
<u>Edward Rubin</u>	, Member	<u>June 3, 2015</u> <small>Date Approved</small>
<u>Randall Eggert</u>	, Member	<u>June 3, 2015</u> <small>Date Approved</small>

and by **Edward Rubin**, Chair/Dean of
the Department/College/School of **Linguistics**

and by David B. Kieda, Dean of The Graduate School.

ABSTRACT

Cross-linguistically, adverbials appear to be subject to strict ordering restrictions based on semantic subclass. For example, frequentative adverbials (*often*) must precede celerative adverbials (*quickly*), which must precede degree of perfection adverbials (*well*); several other classes of adverbials fill in this ordered hierarchy. Approaches to accounting for this phenomenon include applying semantic and/or syntactic methods of analysis. While several competing explanations for the facts of VP-external adverbial distribution have been offered, the distribution facts themselves are not controversial.

In contrast to the distribution VP-*external* adverbials, that of VP-*internal* adverbials (adverbials within the VP, probably including some preverbal adverbials in English) is not well understood. It seems likely that VP-internal adverbials, like VP-external adverbials, do appear in a set order relative to each other. This thesis examines the semantic subcategories of potentially VP-internal adverbials and takes as its main purpose to verify, based on solicited grammaticality judgments, whether or not such VP-internal adverbials are indeed subject to ordering restrictions similar to those affecting pre-VP adverbial distribution. Grammaticality judgments are also used to try to determine what effects (if any) adverbial length or complexity have on adverbial positional licensing within the VP. Pilot study findings suggest that VP-internal adverbials do demonstrate ordering restrictions based on semantic subcategory, and also that phonological considerations may bear a significant impact on the grammaticality of

adverbial positioning within the VP. The implications for future experimental work as well as for the theory of adverbial distribution are discussed.

To my family

TABLE OF CONTENTS

ABSTRACT.....	iii
ACKNOWLEDGEMENTS	viii
Chapters	
1. INTRODUCTION AND LITERATURE REVIEW	1
1.1 Introduction.....	1
1.2 Literature Review.....	2
1.2.1 Cinque 1999, 2004	3
1.2.2 Ernst 2002, 2004.....	7
1.2.3 Nilsen 2004.....	14
1.2.4 Biskup 2011.....	18
1.3 Conclusion	25
2. VP-INTERNAL ADVERBIALS.....	26
2.1 Subclassification	27
2.2 Diagnostics.....	32
2.2.1 Cinque 1999	32
2.2.2 Ernst 2004.....	36
2.2.3 Biskup 2011.....	39
2.2.4 Huddleston & Pullum 2002	39
2.2.5 Quirk et al. 1985	40
2.2.6 Some Notes.....	40
2.3 Ordering	43
3. METHODOLOGY	45
3.1 General Considerations.....	45
3.2 Experimental Design.....	47
3.2.1 Likert Scale Task.....	47
3.2.2 Instructions	48
3.2.3 Materials.....	48
3.2.4 Sample Size and Participants	53
3.2.5 Analysis.....	53

4. RESULTS AND ANALYSIS.....	54
4.1 Results and Discussion	54
4.2 Limitations	59
4.3 Implications.....	61
4.3.1 Theory	61
4.3.2 Future Research.....	64
4.4 Conclusion	65
Appendices	
A. ADVERBIAL CLASSES	66
B. QUESTIONNAIRE SCRIPT	73
C. STATISTICAL METHODS	116
D. ADVERBIAL RELATIONSHIPS.....	118
REFERENCES	125

ACKNOWLEDGEMENTS

More than just the work of an individual, this thesis represents the support of a whole community, and to each member of that community, I owe a deep debt of gratitude. First, to Aniko Csirmaz, my advisor, I express my utmost respect, admiration, and appreciation. Your brilliance and enthusiasm inspired me at the best times, your patience and kindness encouraged me at the worst times, and your firm support and quiet leadership guided me always. Thank you. Many thanks also to Ed Rubin and Randy Eggert, my committee members; you provided me not only with important insights and feedback on my research and thesis, but also with valuable advice on being an academic linguist and an instructor.

Without data, there would have been no thesis to write; I am very grateful to all of the participants of my pilot study for their time and feedback, and indebted as well to any future participants in this research project. My thanks also to Jenny Culbertson, Shannon Barrios, Abby Kaplan, and especially Greg Stoddard for their help in the design of my study, and to Greg Stoddard additionally for his invaluable assistance with the analysis. Through Greg, this investigation was supported by the University of Utah Study Design and Biostatistics Center, with funding in part from the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant 8UL1TR000105 (formerly UL1RR025764).

Heartfelt thanks to my friends and colleagues from the ESL Program, the Department of Languages and Literature, and Tanner Dance; and especially to my fellow grad students in the Department of Linguistics: Your support and friendship have meant the world to me, and without them I would never have finished this degree.

Last but not least, my family: To my parents and my sister, and to Clare, Keith, and Toni, many, many thanks for your unwavering love and encouragement. And to Laura, who has steadfastly supported me, cheered me on, and put up with me throughout this whole process and even, by some miracle, married me along the way: Thank you, and I love you.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

Adverbs and adverbials compose an intriguing syntactic category subject to much debate in the fields of syntax and semantics; it is not clear how these entities are incorporated into the clausal structure, nor what the subclasses of the class of adverbials are. In addition, empirical evidence suggests that, cross-linguistically, certain kinds of adverbials can be licensed only in certain positions within a clause (Bartsch 1976; Cinque 1999, 2004). Several explanations have been proposed to account wholly or partially for this phenomenon (Bartsch 1976; Cinque 1999, 2004; Ernst 2002, 2004; Nilsen 2000, 2004; Biskup 2010; Bowers 1993; McConnell-Ginet 1982), but each has its weaknesses.

While the fact is well documented that adverbials appearing in higher positions within a clause are rigidly ordered with respect to each other, the restrictions governing adverbial distribution within the verb phrase are not at all clear. Cinque (1999), for example, claims that such adverbials are not ordered at all, which is directly refuted by Ernst (2002, 2004) and Nilsen (2004), among others.

In this thesis, I will address adverbial place licensing, specifically examining VP-internal adverbial ordering in English: what the relevant adverbial subclasses are, how they are ordered relative to each other, what effect an adverbial's status as part of the

matrix or embedded clause has on such ordering, what effect an adverbial's length and complexity have on ordering, and whether any explanation for the phenomena can be found. For these purposes, I will follow Ernst's (2004) characterization of VP-internal adverbials as adverbials which appear in the portion of a sentence ranging from the immediately preverbal position rightward to end of the sentence in English.

In this introduction, I will give an overview of some of the above-named approaches to adverbial ordering. In later chapters, I will examine the subclassification and ordering of VP-internal adverbials, and attempt to offer an analysis of VP-internal adverbial ordering.

1.2 Literature Review

Among the explanations offered by Bartsch, Cinque, and others to account for adverbial ordering, arguably the most striking and controversial is the proposal advanced in Cinque 1999 that there exists universally a rigid hierarchy of maximally projecting functional heads. VP-external adverbials appear as specifiers to these functional heads, and each class of adverbials corresponds to a specific functional head; thus Cinque explains the inflexible ordering observed among pre-VP adverbials.

Cinque's (1999, 2004) analysis is appealing because it does appear to account for at least some of the facts observed of adverbial distribution. However, it is inherently anti-minimalist (Chomsky 1995) in that it posits the independent existence of a large and unwieldy chunk of structure that must appear in its entirety, even in the absence of any content. In addition, Cinque does not offer an explanation of the structure or the ordering of the functional heads; he merely claims that they exist.

Alternatives to Cinque (1999, 2004) offer semantic (Ernst 2002, 2004; Nilsen 2004) and syntactic (Biskup 2011) approaches to explaining some of the same observations. Some of these approaches (Ernst 2002, 2004; Biskup 2011) explicitly address VP-internal adverbials, while others (Cinque 1999, 2004; Nilsen 2004) do not. Ernst's (2002, 2004) Fact-Event Object (FEO) Calculus approach analyzes VP-internal adverbs as event-modifying elements whose distribution is regulated by semantic restrictions on the kinds of modification possible. Nilsen 2004 focuses on a narrow subclass of adverbials, but argues that (semantic) considerations of scope and directional entailment can adequately explain some of the facts about speaker-oriented adverbials' distribution. Biskup 2011 asserts that the vP phase edge is an important syntactic and semantic boundary that can also explain some of the observed ordering of adverbials.

1.2.1 Cinque 1999, 2004

In *Adverbs and functional heads: A cross-linguistic perspective*, Cinque (1999) proposes a radical new analysis of the syntactic structure of adverbials and how they are attached to the structure of a clause: He argues that rather than being adjoined to the clausal structure, an adverb or adverbial actually occupies the position of specifier to one of many distinct functional heads. These functional heads, which may or may not be null, form a rigidly ordered hierarchy.

Cinque 1999 begins by examining data from Italian to describe the order in which VP-external adverbs appear. (He does not address VP-internal adverbials—which are called "circumstantial adverbs" (p. 28)—such as those following the verb complement which denote "place, time, manner, means, company, reason, purpose, and so forth" (p.

28). Instead, he merely points out that these kinds of adverbials do not appear to be subject to the same kind of strict ordering requirements governing the distribution of other adverbials.) By the property of transitivity, he derives orderings for "higher" and "lower" pre-VP adverbials, and proposes that the ordering applies for all Romance languages. Cinque then uses cross-linguistic data from several sources to claim that there exists a universal ordering of pre-VP adverbials very similar—if not identical—to the following "Romance/Germanic" ordering:

(1) frankly > fortunately > allegedly > probably > once/then > perhaps > wisely >
usually > already > no longer > always > completely > well

(Cinque 1999:34)

Cinque 1999 changes tack to argue that adverbials occupy specifier rather than adjunction positions. According to Cinque, "conceptual considerations" (p. 44) in favor of this structure include the following: First, demonstrating that some of the syntactic entities assumed to be adjuncts are actually specifiers could provide support for eliminating the category of adjunct altogether. Also, it could explain the observed relative ordering of adverbials and, assuming Kayne (1994) antisymmetry, force adverbials to be positioned on the left branch.

Cinque (1999), in order to provide empirical support for his hypothesis locating AdvPs in the Spec position, points to Italian data showing that "an active past participle can be found preceding, or following, each AdvP in the sequence" (p. 45). He claims that, given X-bar theory (Chomsky 1970, Kayne 1994) and "optional" (p. 46) verb

movement, these data support his hypothesis. Cinque further asserts the superiority of his hypothesis over the theory of adverbial adjunction in that it is falsifiable: So-called "AdvP-in-Spec" (p. 45) predicts the nonexistence of certain Romance varieties; the discovery of one of these varieties would disprove his hypothesis (p. 48).

After using data from several different languages to come up with an order for the functional projecting heads, Cinque (1999) matches this ordering with the one he provided earlier for adverbials, with the result being the following "universal hierarchy of clausal functional projections" (p. 106):

- (2) [*frankly* Mood_{speech act}] [*fortunately* Mood_{evaluative}] [*allegedly* Mood_{evidential}]
 [*probably* Mod_{epistemic}] [*once* T(Past)] [*then* T(Future)] [*perhaps* Mood_{irrealis}]
 [*necessarily* Mod_{necessity}] [*possibly* Mod_{possibility}] [*usually* Asp_{habitual}]
 [*again* Asp_{repetitive(I)}] [*often* Asp_{frequentative(I)}] [*intentionally* Mod_{volitional}]
 [*quickly* Asp_{celerative(I)}] [*already* T(Anterior)] [*no longer* Asp_{terminative}]
 [*still* Asp_{continuative}] [*always* ASP_{perfect(?)}] [*just* Asp_{retrospective}] [*soon* Asp_{proximative}]
 [*briefly* Asp_{durative}] [*characteristically(?)* Asp_{generic/progressive}] [*almost* Asp_{prospective}]
 [*completely* Asp_{SgCompletive(I)}] [*tutto* Asp_{PLCompletive}] [*well* Voice]
 [*fast/early* Asp_{celerative(II)}] [*again* Asp_{repetitive(II)}] [*often* Asp_{frequentative(II)}]
 [*completely* Asp_{SgCompletive(II)}]

(Cinque 1999:106)

In addition, Cinque states that the above list is incomplete; other adverb classes and functional heads have yet to be categorized and placed within the hierarchy. Cinque

assumes that all such adverbial classes and functional heads will eventually be found, however.

Perhaps most controversially, Cinque 1999 asserts that the structure seen in (2) is a part of UG, and that "the entire array of functional heads (and projections) is available even when there is no overt morphology corresponding to the heads" (p. 106). This statement seems to imply that the entire structure must also be available even if no adverbial specifiers are present in the clause; Cinque confirms this interpretation by comparing his system favorably with one wherein "where there is neither head morphology nor adverbs corresponding to a particular functional projection, that projection will not be projected" (p. 133). According to Cinque, the constant presence of the entire hierarchical structure of projecting functional heads is actually more in keeping with the spirit of Minimalism (Chomsky 1995) than such an alternative in that his system does not require any additional mechanisms to interpret the absence of a projection in the event that there is neither adverbial nor overt morphological representation of a given functional head. The alternative system would require separate mechanisms for interpreting clauses where "functional structure" (p. 133) appears versus those where it does not, Cinque claims.

In addition, Cinque (1999) anticipates arguments that the rigid adverbial/functional ordering observed may actually be ascribable to "semantic, or logical, properties" (p. 135). He dismisses such arguments, however, pointing out that while some parts of the hierarchy do seem to reflect logical considerations, other aspects contradict what would be expected if semantic scope alone were enough to explain the phenomenon.

In "Issues in adverbial syntax", Cinque (2004) offers further support for his analysis of adverbials as specifiers in a clausal hierarchy. He fleshes out his objections to semantically-based approaches by first pointing out that there seems to be no obvious, inherent reason for some subclasses of adverbials to be governed by place restrictions, while others are not. (However, the example provided—"John is lovingly a coward" (p. 686)—seems strange because it can not illustrate his point that there are no adverbs conveying the "speaker's sentimental attitude toward his/her assertion" (p. 686).) He also claims that semantic approaches cannot account for some of the interactions observed between adverbs and verbs, and adverbs and arguments; and, further, that even the possible existence of "zones" within the clause (which may be the result of semantic scope requirements) is not reason enough to take syntactic structure out of consideration as the reason for adverbial ordering.

With regard to VP-internal adverbials specifically, Cinque (1999) states that such adverbials do not demonstrate the same ordering phenomenon seen in the distribution of other adverbials (p. 28). In Cinque 2004, he hypothesizes that in cases where adverbials appear to be non-rigidly ordered, the adverbials are actually underspecified, and thus able to appear in more than one specifier position (p. 692).

1.2.2 Ernst 2002, 2004

In "Principles of adverbial distribution in the lower clause", Ernst 2004 proposes a semantic mechanism through which adverbial positioning in the "Low Range" (p. 756) could be derived. He defines the Low Range as extending from the immediately preverbal position to the right edge of the sentence in verb-initial languages such as

English (p. 756). Adverbials within this range are "widely recognized" (p. 756), according to Ernst, as being event-internal (somehow modifying the verb, or "designat[ing] a subset of the events denoted by the predicate" (p. 756)). Classes of adverbials that appear within this range include manner adverbs (*defly* (p. 762)), measure adverbs (*completely* (p. 767)), domain adverbs (*politically* (p. 767)), and some iterative adverbs (*again* (p. 756)) (p. 756).

Ernst states that positional licensing of adverbials' (and not only Low Range adverbials but other adjuncts as well) base position derives from application of a relevant semantic rule¹ and is dependent on the well-formedness of the resulting local structure as well as the sentence as a whole (p. 760). Whether a resulting structure will be well-formed or not can be calculated using Ernst's FEO Calculus (see (10) and (11) below). Further, he predicts that an adverbial could have multiple base positions since the semantic rule itself is not restricted to application in only one position. However, positional licensing of a given adverbial (or possibly subclass of adverbials, although Ernst does not say so) is restricted to a certain "zone" (p. 756) within the clause.

Data that capture the phenomena that Ernst attempts to explain:

- (3) a. (*Completely) She (*completely) will (*completely) be (completely) finishing her work (completely).
- b. (Again) She (again) will (again) be (again) finishing her work (again).

¹ In the case of manner adverbials, where F indicates the main verb predicate and P the adverbial "adjectival predicate" (p. 763):

Manner Rule:

A predication adverb may select an event (F(x, ...) ...1 denoted by its sister, yielding:

$[_E[_E F(e) \ \& \ \theta(e, x), \dots] \ \& \ P_{ADJ}([_E F(e) \ \& \ \theta(e, x), \dots], x)],$

where the comparison class for P_{ADJ} is all events of F-ing.

- (4) a. Bob played the waltz perfectly.
 b. *Bob perfectly played the waltz.
- (5) a. Tori closed the door again.
 b. *Tori again closed the door. (on restitutive reading)
- (6) a. Zhangsan ba tade dongxi luan diu-le.
 Zhangsan BA his things chaotically throw-PRF
 'Zhangsan threw his things all over the place.'
 b. *Zhangsan ba tade dongxi diu-le luan.
 Zhangsan BA his things throw-PRF chaotically

(Ernst 2004:757)

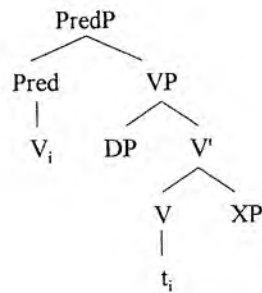
The data in (3) show that there are some zonal restrictions on certain adverbs that do not apply to some other adverbs. In (4), we see that a degree adverb like *perfectly* cannot occur preverbally in English. The data in (5) show that certain readings of some adverbials also seem to be zonally restricted. In (6), the data showing that *luan* 'chaotically' can only occur preverbally, even though the adverb's positions in (6a) and (6b) are both VP-internal, illustrate that even within the VP some adverbials can only appear in designated positions.

The explanation that Ernst proposes to account for adverbial distribution rests on several assumptions: First, Ernst states that his aim is to find principles by which to explain the phenomena described above. (This statement might be interpreted as a sally directed at Cinque, given Ernst's contrasting of his goals with proposals which "merely state that an adverb of such-and-such class simply has a certain base position (in what

amounts to a list of positions), without seeking larger generalizations about its distribution" (p. 757)). Second, Ernst assumes that semantic considerations must be taken into account in explaining adverbial distribution. Third, he assumes (contra Kayne 1994) that whether complements come to the left or right of the head is part of a language's parameters (also assuming a Principles & Parameters (Chomsky 1981) syntactic context, although with a "minimalist spirit" (p. 758) (Chomsky 1995)), and also that UG includes rightward movement, although such movement is restricted by Weight Theory (Culicover & Rochement 1990; Rochement & Culicover 1990; Wasow 1997).

In addition, Ernst assumes Hale & Keyser's (1993) L-syntactic description of the lower clause, using for his analysis a structure proposed by Bowers (1993) (where PredP can be interpreted as an analog of vP)²:

(7)

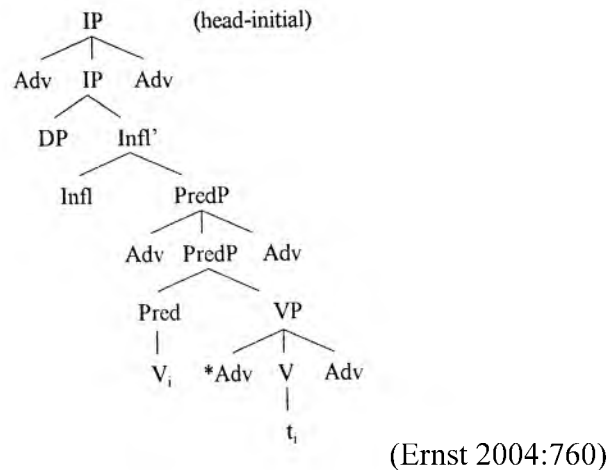


(Ernst 2004:759)

² Nothing in Ernst's analysis hinges particularly upon these details, which have been included merely to provide context.

This structure, in conjunction with Ernst's claim that in head-initial languages, "adverbials adjoin to the left or right in functional projections; adverbials adjoin to the right (only) in lexical projections" (p. 759), yields the following structure:

(8)



This structure will be relevant to discussion later in this thesis because of the predictions it makes with respect to adverbials very low in the tree as well as the adverbials appearing at the end of the English sentence.

Semantic assumptions Ernst makes include the notion that adverbial grammaticality (via interpretability) relies on application of a semantic rule to the adverbial, which is only possible if the adverbial is found in a position where the relevant rule can apply. Although Ernst aims for a "maximally simple" (p. 760) approach, he posits the need for a single "structural constraint" governing interpretation:

(9) (Only) event-internal modification is possible in L-syntax.

(Ernst 2004:760)

Ernst also assumes that the Fact-Event Object (FEO) Calculus system that he proposed in 2002 to explain semantic composition through restricted combination of semantic types also applies to adjunction of adverbials. This approach is driven by the FEO hierarchy in (10) and the constraint in (11):

(10) Speech-Act > Fact > Proposition > Event > Specified Event

(Ernst 2002:53)

(11) Main Constraint on the FEO Calculus: Any FEO type may be freely converted to any higher FEO type; but not lowered.

(Ernst 2004:761)

Speech-acts, propositions, and events in this system take the characteristics they are usually understood to have; facts are true propositions, and specified events are events which have been modified to have a manner reading (and thus can be compared with events of the same type which have different specifications). Ernst explicitly states that although there may be broad correlations, none of these objects necessarily corresponds exactly with any syntactic structural entity (2002:53).

Along with (9), (10), and (11), an adverbial's subclass requirements designating the type of entity it can adjoin to determine in which clausal positions it can be licensed. An adverbial can only combine with certain of the five different entities in the FEO hierarchy, and thus those combinations can result in only specific structures; the possible entities that an adverbial can combine with are dictated by its subclass requirements.

projections, where they can adjoin either to the right or left), the restitutive reading is not available to the left of the verb.

1.2.3 Nilsen 2004

Nilsen examines the logical environment of sentential adverbials as it relates to their distribution, focusing in "Domains for adverbs" (2004) on certain specific adverbs (primarily *possibly*). It is generally accepted, he states, that negative polarity items (NPIs) are licensed in downwards entailing environments and PPIs are excluded from such contexts; and further, that some adverbials are NPIs. Nilsen posits that some speaker-oriented adverbials (SOAs) are PPIs, and some SOAs also create PPI-excluding environments, which yields the ordering restrictions of certain combinations of adverbials.

According to Nilsen, SOAs (including evaluatives, evidentials, and some modals as in (12)) are degraded in questions (13a), antecedents of conditionals (13b), imperatives (13c), under negation (13d), under clause-embedding predicates (13e), and within the scope of monotone decreasing subject quantifiers (13f) (paraphrased from p. 811):

(12) heldigvis,	tydeligvis,	paradoksalt nok,	ærlig talt,	
fortunately	evidently	paradoxically	honestly	
muligens,	kanskje,	sannsynligvis,	angivelig,	neppe
possibly	maybe	probably	allegedly	hardly

(13) [Norwegian]

- a. Spiste Ståle (*ADV) hvetekakene?
 ate S (*ADV) the-wheaties
 "Did Stanley (*ADV) eat the wheaties?"
- b. Hvis Ståle (*ADV) spiste hvetekakene, . . .
 if S (*ADV) ate the-wheaties
- c. (*ADV) Spis (*ADV) hvetekakene!
 (*ADV) eat (*ADV) the-wheaties
- d. Ståle spiste (ADV) ikke (*ADV) hvetekakene.
 S ate (ADV) not (*ADV) the-wheaties
 "Stanley (ADV) didn't (*ADV) eat the wheaties."
- e. Jeg håper Ståle (*ADV) spiste hvetekakene.
 I hope S (*ADV) ate the-wheaties
- f. Ingen studenter (*ADV) spiste hvetekakene.
 no students (*ADV) ate the-wheaties

(Nilsen 2004:811)

In addition, SOAs can appear in degree clauses (14a), under clause embedders (14b), and in ordinary declaratives (14c):

(14) a. Ståle var så sulten at han (ADV) spiste hvetekaker.

S was so hungry that he (ADV) ate wheaties

b. Jeg tror Ståle (ADV) spiste hvetekakene.

I think S (ADV) ate the-wheaties

c. Ståle spiste (ADV) hvetekakene.

S ate (ADV) the-wheaties

(Nilsen 2004:811)

Further, from evidence in English, Greek, and Dutch that SOAs cannot appear in NPI-licensing environments, Nilsen concludes that SOAs are PPIs and thus cannot be licensed in downwards entailing (DE) contexts (p. 811).

Next, Nilsen assumes non-veridical (NV) environments as a superset of downwards entailing environments (p. 814). "Weak" NPIs (p. 813) can be licensed in such a NV environment, which as an operator applied to a proposition does not entail that proposition (as opposed either to entailing that proposition or entailing *not* that proposition) (p. 814). Support for assuming non-veridicality is provided by existential modals, imperatives, and generics, according to Nilsen.

Nilsen reasons that since SOAs are PPIs, if SOAs are excluded from NV environments (as they are from downward entailing environments), then the SOAs in (15) should not be able to outscope other SOAs (SOAs in (15a) come from (2) above, Cinque 1999):

- (15) a. allegedly, probably, perhaps, possibly, usually, no longer
 b. hardly, never, rarely, not

(Nilsen 2004:816)

However, the data in (16) show that, in fact, SOAs can outscope other SOAs:

- (16) **Allegedly**, Enron was **probably/possibly** going bankrupt.

(Nilsen 2004:819)

Thus Nilsen concludes that "SOA are excluded from DE environments but allowed in NV environments " (p. 820). He uses similar calculations to derive distribution of "phase quantifiers like *already/still*" (p. 822) and "upwards entailing (UE) frequency adverbs, like *always* and *often*" (822). Nilsen also examines the differences between licensed environments of adverbs and corresponding adjectives, specifically looking at *possibly/possible*. He finds that *possibly*, when combined with propositions, results in semantically "stronger statements" than does *possible*; this explains the observed distributional differences (p. 837).

Nilsen's approach does not address VP-internal adverbials specifically, and it is safe to assume that of the combinations of SOAs that he examines, at least one will usually occur outside the VP. However, it is not clear whether or not a similar method of examining the relative semantic strengths of VP-internal structures modified by adverbial operators could yield explanations or predictions about VP-internal ordering.

1.2.4 Biskup 2011

In *Adverbials and the phase model*, Biskup 2011 argues against a feature-based (Alexiadou 1997, Cinque 1999, Laenzlinger 2002) approach to adverbials, providing evidence for a model of adverbial distribution based on the ν P phase edge as a syntactically, semantically, and information-structurally important boundary. Assuming Diesing 1992 and Chomsky's (2001) phase model (p. 7), Biskup asserts that items within the ν P phase are in the "nuclear scope of the quantificational structure" (p. 7) and are informationally focused. Correspondingly, elements in the CP phase are found in the quantificational restrictive clause and are backgrounded; this correlation of syntactic, semantic, and information-structural boundaries yields the interpretation of NPs and adverbials based on clausal position. Only overt position is relevant for information structure interpretation, but both covert and overt positions are used in semantic interpretation (p. 33).

Since Biskup assumes that Case and theta-role considerations do not drive movement (p. 14), and since he also assumes, following Chomsky (1995), the Last Resort principle,

(17) *Last Resort*

Move is driven by feature checking

(Biskup 2011:32)

he argues that all movement relevant to his analysis (including overt and covert quantifier raising (QR) (p. 15-17) and topicalization) is motivated by some unspecified μ -feature.

Following Pesetsky & Torrego's (2007) claim that "all four combinations of the (un)valued and (un)interpretable property are possible" (p. 33), Biskup posits an unvalued, uninterpretable μ -feature on the probe and an interpretable μ -feature on the goal. In order to get the correct actions at both the phonological and semantic interfaces (e.g., so that an overtly-moved element is spelled out by PF in the CP and interpreted by LF as being in the background domain and the restrictive clause), Biskup argues that the μ -feature has a "generalized EPP-feature as its subfeature" (as described in Pesetsky & Torrego 2001). The effect of μ -feature-motivated movement is to allow the correct informational and semantic readings.

In addition, in order to derive object shift and other movements from the vP , Biskup proposes Phase Featuring:

(18) *Phase Featuring*

If a goal feature F does not have its movement probe feature F in its current phase subarray, add an unvalued uninterpretable F -feature onto the phase head.

(Biskup 2011:46)

Biskup states that the set of possible "movement probe feature[s] F " does not include ϕ -features, but rather the μ -feature and the wh -feature.

In order to ensure that a goal feature and its corresponding probe feature match appropriately, and also to avoid look-ahead (p. 49), Biskup adopts a slightly altered version of Müller's (2004) Feature Balance principle:

(19) *Feature Balance*

For every probe feature F, there must be exactly one goal feature F in the lexical array.

(Biskup 2011:48)

Here is an example of how this system works:

(20) a. *Pavel*₁ *dětem*₂ *dopisy*₃ [_{VP} *odpoledne* t₁ *pošle* t₂ t₃

Pavel.NOM children.DAT letters.ACC in the afternoon sends
do Prahy].

to Prague

'Pavel will send the children the letters to Prague in the afternoon.'

b. *Pavel*₁ *dopisy*₃ *dětem*₂ [_{VP} *odpoledne* t₁ *pošle* t₂ t₃

Pavel.NOM letters.ACC children.DAT in the afternoon sends
do Prahy].

to Prague

'Pavel will send the children the letters to Prague in the afternoon.'

(Biskup 2011:50-51)

In this example, scrambling to the TP is precipitated by the μ_{EPP} -feature. Biskup derives the structure following these steps:

(21) a. LA: { $\mu_{1\text{EPP}}$ on T, $\mu_{2\text{EPP}}$ on T,

$\mu_{1\text{EPP}}$ on *dětem*, $\mu_{2\text{EPP}}$ on *dopisy*

b. $SA_{\nu P}$: {added μ_{1EPP} on ν , added μ_{2EPP} on ν }

μ_{1EPP} on *dětem*, μ_{2EPP} on *dopisy*

(Biskup 2011:51)

In (21a), each scrambled element in the lexical array (LA) gets a μ_{EPP} -feature; the features get separate indices so that each probe on the T has only one goal. Phase Featuring is applied at the νP level in the lexical subarray (SA), with the result shown in (21b).

Having laid out the basic mechanics of his proposed system, Biskup then applies them to an analysis of adverbial distribution. He uses data primarily from Czech (p. 123) and examines several phenomena related to adverbial positional licensing, arguing against a feature-based approach in favor of an adjunct-based approach. The type of approach he adopts is similar to the approach in Ernst 2004, but rather than being based on categories like those in Ernst's FEO Calculus, it is instead built upon the distinction between the CP and the νP discussed above (p. 20), in which information found in the νP is focused, whereas that found in the CP is backgrounded.

One major flaw of the feature-based approach, first described in Abels 2003, is that there is evidence that some kinds of ordering restrictions still apply to adverbials from different clauses relative to each other (p. 130):

(22) a. It is already the case that he no longer goes to school.

b. *It is no longer the case that he already goes to school.

(Abels 2003:109, via Biskup 2011:132)

Biskup provides similar examples from Czech further demonstrating the interaction of adverbials in different clauses.

In describing adverbial distribution, Biskup separates preverbal adverbials from circumstantial adverbials. Among preverbal adverbials (adverbials found preverbally in English), Biskup specifically examines evaluative 'fortunately', epistemic 'probably', epistemic/irrealis 'perhaps', frequentative 'often', and celerative/manner 'quickly' adverbials in Czech (p. 124). His data bear out the earlier conclusions of Alexiadou 1997, Cinque 1999, Ernst 2002, and Laenzlinger 2002; he finds the ordering among those adverbials generally to be: evaluative > epistemic > irrealis > frequentative > celerative/manner (p. 125).

Among circumstantial adverbials, the order that Biskup's data support is generally as follows: temporal > locative > manner (p. 126). In addition, Biskup argues that between two adverbials of the same class, the "superset adverbial, i.e., the adverbial of the larger domain, mostly precedes the subset adverbial" (Biskup 2011:127), a version of the Superset Subset Principle (defined in (25) below). The following examples illustrate this phenomenon:

(23) Temporals: *včera* 'yesterday' and *večer* 'in the evening'

a. order *včera* *večer*: 1238 occurrences

b. order *večer* *včera*: 43 occurrences/2 relevant

(24) Locatives: *doma* 'at home' and *v pokoji* 'in the room'

a. order *doma v pokoji*: 12 occurrences/7 relevant

b. order *v pokoji doma*: 0 occurrences

(Biskup 2011:127)

Assuming that linear order corresponds with syntactic structure, he further asserts that "hierarchically higher" adverbials' appearing to the left of lower adverbials means that "non-clausal adverbials are adjoined to the left in Czech" (p. 127), contra Ernst 2003.

In addition, Biskup offers data which he claims show that stacked adverbials of the same class act as one constituent (p. 140), and are ordered such that a Superset Subset Principle (p. 142) applies. According to this principle, "semantic (set) relations between the stacked adverbials must parallel their syntactic (c-command) relations" (p. 142). Based on data from non-stacked adverbials in Czech, he refines the Superset Subset Principle as follows:

(25) *Superset Subset Principle*

The highest segment of the adverbial of the larger domain must c-command at least one segment of the adverbial of the smaller domain if the adverbials relate to the same event.

(Biskup 2011:151)

Biskup next observes that "stacked adverbials expressing a path or an interval" (p. 154) are subject to a similar ordering restriction:

(26) a. *Od dvou do pěti by Pavel pracoval rád.*

from two to five would Pavel.NOM worked glad

'Pavel would like to work from 2 pm to 5 pm'.

b. **Do pěti od dvou by Pavel pracoval rád.*

to five from two would Pavel.NOM worked glad

(Biskup 2011:154)

In order to account for this pattern, he proposes the Principle of Natural Progress of Intervals:

(27) *Principle of Natural Progress of Intervals*

The highest segment of the adverbial that is closer to the starting point of the interval must c-command at least one segment of the adverbial that is further from the starting point if the adverbials relate to the same event.

(Biskup 2011:155)

In (27), *interval* can refer to spatial, temporal, or abstract intervals. Through (25) and (27), Biskup claims to account for ordering of both stacked and non-stacked adverbials whether they appear in the same clause or not.

Lastly, Biskup argues that certain exceptions to the observed adverbial ordering discussed earlier can be explained by adverbial movement across a phase edge. He claims that preverbal and circumstantial adverbials can perform both short and long

movement, motivated by the μ -feature, the μ_{EPP} -feature, or the EPP-feature (166-169). This movement includes topicalization and scrambling (p. 169).

Biskup offers a description and some evidence for VP-internal adverbial ordering, but provides no explanation for that ordering, except for when the VP includes two adverbials of the same class.

1.3 Conclusion

None of the approaches to adverbial ordering discussed above addresses VP-internal ordering as satisfactorily as might be hoped: The Cinque 1999, 2004 and Biskup 2011 approaches do not offer a real explanation for the ordering; the Nilsen 2004 approach, while very explanatory, focuses only on a very small subset of adverbials (and usually at least one of these SOAs in a clause will be VP-external); and the Ernst 2004 approach relies on nonstandard assumptions and does not clearly account for the ordering of multiple VP-internal adverbials. In addition, the basic facts of VP-internal adverbial distribution are not undisputed among these researchers. Thus, further research into the ordering of VP-internal adverbials, and the explanation for their ordering, is justified.

CHAPTER 2

VP-INTERNAL ADVERBIALS

This project takes as its subject the ordering of VP-internal adverbials; therefore, this second section will be devoted to the subclassification of adverbials (particularly adverbials described as being circumstantial, VP-internal, or otherwise modifying the VP) as well as potential diagnostics for determining whether a given adverbial is located within the VP. A very brief overview of the descriptions of VP-internal adverbial ordering available in the literature will also be provided. In general, the literature on adverbial classes and ordering is surprisingly sparse for such a rich and interesting field of linguistic phenomena.

2.1 Subclassification

As mentioned in the introduction, adverbials are not an easy category to define because of the nebulous borders of the category in relation to other grammatical categories as well as the lack of consensus about how they connect to the syntactic structure of a clause; therefore, a search of what descriptive English grammars say about adverbials and adverbial subclasses might be considered a sound place to start. The available descriptions of adverbial subcategories and ordering vary widely in scope, approach, and content, but such a search inevitably focuses on two main sources: Quirk,

Greenbaum, Leech, & Svartvik 1985 and Huddleston & Pullum 2002, both comprehensive descriptive grammars of the English language. Both of these works provide very detailed and helpful information generally, with greater or lesser amounts of attention paid to describing adverbial subclassification, ordering, and positioning within a sentence's clausal structure or linear order; there are also (naturally) limitations to each. I will describe here some of the more salient contributions of each of those sources to this endeavor; a more comprehensive summary of generally relevant information is included in the appendices (Appendix A).

The first question to address is which adverbials should be considered VP-internal. Quirk et al. 1985, taking a functional approach to adverbials based on their semantic roles, separate predication adjuncts from sentence adjuncts (p. 503), from which it may be inferred that only predication adjuncts should be considered as possibly being VP-internal. The statement that predication adjuncts are found at the end of a clause, "following all obligatory elements" (p. 498) supports this conclusion in that such linear positions frequently correlate with low syntactic position, although it is important to note that, as will be discussed in greater detail later in this section, the overlap between the sets of VP-internal adverbials and adverbials found in this type of clause-final position is not complete. Predication adjuncts are further subdivided into obligatory and optional adjuncts, where the former are adverbials that fulfill the roles primarily of verb (see (1) below; Quirk et al. 1985:505) or adjective ((2); p. 506) complements, and the latter are adverbials that modify the predicate.

(1) He lived *in Chicago*.

(Quirk et al. 1985:505)

(2) She is fond *of books*. (Quirk et al. 1985:506)

This distinction is relevant because obligatory sentence elements in English do not have the same range of possible positions available to them that optional elements have, and also because, since one of the aims of this thesis is to examine how adverbials' semantics affect ordering of cooccurring adverbials, all adverbials under consideration must be on the same semantic footing to start with. Thus, so-called "obligatory adjunct" adverbials will be excluded from this analysis, although in some cases, they necessarily belong to the same basic semantic subcategories as optional adjunct adverbials. For example, the same adverbial of position seen as a verb complement in (1) can be used as an optional adjunct, modifying the predicate:

(3) He ate a hotdog *in Chicago*.

Predication adjunct adverbials, according to Quirk et al. 1985, include adjuncts of space, time, process, respect, and contingency. These categories and, in some cases, their subcategories loosely correlate with the VP-internal "circumstantial" adverbials named in Cinque 1999, including "place, time, manner, means, company, reason, purpose, and so forth" (p. 28). The categories can be further subdivided: Space, for example, includes subcategories like position (*in the yard*), direction (*towards the house*), source (*from the shed*), and distance (*for twenty meters*) (Quirk et al. 1985:479-481, 514-520), while time includes position (*at two o'clock*), duration (*for thirty minutes*), frequency (*every other week*), and relationship (*still*) (pp. 479-482, 526-551). Process includes manner

(*carefully*), means (*through hard work*), instrument (*with a spoon*), and agentive (*by the barista*) (pp. 482-483, 556-562); contingency includes cause (*out of sheer nostalgia*), reason (*because she missed the ocean*), purpose (*in order to visit the seaside*), result (*so she decided to go on a trip*), condition (*if the train arrives on time*), and concession (*although she planned ahead*) (pp. 484-485, 564). Many of the subcategories of these semantic categories of adverbials can be even further subdivided. For example, the adverbial *annually* is a "period frequency" adverbial (as opposed to an "occasion frequency" adverbial), which is a subtype of definite (as opposed to indefinite) adverbial, which itself is a type of frequency adverbial (pp. 541-543).

The category of respect adverbials differs from the other categories described in Quirk et al. 1985 in two ways: First, it does not contain subcategories (pp. 483-484, 563), which is interesting but has no bearing on the discussion at hand. In addition, though, I assert that it does not belong among the other categories of predication adjunct adverbials because, more problematically, it does not truly modify the predicate. Adverbials provided as exemplars for this category include the following:

- (4) a. *So far as travelling facilities are concerned* (Quirk et al. 1985:483)
- b. *formally* (Quirk et al. 1985:563)
- c. *on legal issues* (Quirk et al. 1985:563)

Other examples:

(5) They are {fond/frightened *of cats.* / good/skilled *at drawing.* / keen/adamant
on moral standards.}

(Quirk et al. 1985:563)

The simple and phrasal examples in (4) coincide with the subcategory of adverbials that Ernst 2004 designates as domain adverbials; I argue that these adverbials are not VP-internal but instead appear very high in the clausal structure (see Section 2.2.2 below for further discussion). Meanwhile, the examples in the sentences in (5) clearly function as "obligatory adjunct" (Quirk et al. 1985:505-506) complements to adjectives (cf. the adjective used in (2)).

The categories of adverbials that are VP-oriented according Huddleston & Pullum 2002 largely overlap with those categories (minus adverbials of respect) discussed above. They are adverbials of manner, means/instrument, act-related (including "subjective type" examples like *foolishly* as well as "volitional type" examples such as *intentionally* (p. 578)), temporal location, duration, aspectuality (which corresponds with the Quirk et al. 1985 time-relationship subcategory, containing examples like *already* and *still* (Huddleston & Pullum 2002:576)), frequency, and serial order (*last*) (p. 576).

In addition, there is the category of adverbials of degree (such as *badly*, *quite*, *a little*, *completely*): Huddleston & Pullum 2002 include this subtype of adverbial among the other VP-oriented adjuncts listed above (p. 576). Ernst 2004 describes it as being VP-modifying and located in the Low Range, and terms this type of adverbial a "measure" adverbial (p. 756). Quirk et al. 1985 does not specifically include this type of adverbials—called a "degree" adverbial again (p. 484)—among the predication

adverbials, but nevertheless provides more support for considering these adverbials to be VP-internal: a) They interact with adverbials of respect in similar ways as do adverbials of place, time process, and result (p. 484)—all VP-internal; and b) The adverbial position "immediately before the main verb . . . is the END MEDIAL position . . . associated with degree and manner adverbials" (p. 495).

The position mentioned in Quirk et al. 1985 is the same "immediately preverbal" (p. 756) position that Ernst 2004 states constitutes the left boundary (inclusive) of the Low Range, in which adverbials should be considered to be verb modifiers. Cinque 1999 does not list adverbials of degree (or similar semantic type) among the circumstantial adverbials considered to be VP-internal, but consider the following: Cinque describes the range in which "'Lower' (pre-VP) AdvPs" are found as "delimited on the left by the leftmost position that an (active) past participle can . . . occupy and on the right by a complement (or the subject) of the past participle" in Italian (p. 4). He finds that the lowest of these lower pre-VP adverbs have the following hierarchy:

(6) *completamente* > *tutto* > *bene* (Cinque 1999:11)

Completamente ('completely' in English (Cinque 1999:8)) and *bene* ('well') would both be categorized as verb-modifying measure or degree adverbials according to the subclassifications discussed above⁴. Indeed, Cinque 1999 notes that the lowest position

⁴ On the assumption that Italian is like English, *bene* could be an adverb of both manner and degree. See English examples:

- (i) Before hiring Kate, the search committee vetted her well. (degree)
- (ii) Kate reads well. (manner)

in this hierarchy of pre-VP adverbials—the one occupied by *bene*—"appears to be a position for manner adverbs, and possibly a few other classes, like . . . measure adverbs" (p. 11). Thus, I conclude that at least this lowest position in the hierarchy of allegedly pre-VP adverbials should in reality be considered to be part of the VP, as should perhaps even the position or two above it. Ideally there will be a way to determine the boundary of the VP with respect to the hierarchy of adverbials (assuming that VP-internal adverbials are also rigidly ordered).

2.2 Diagnostics

Before any facts can be asserted about the ordering of VP-internal adverbials, there must be a way to determine which adverbials are truly VP-internal—i.e., whether an adverbial appearing near or after the verb in English is located within the VP or whether it actually takes a position higher in the clausal structure. In this section, I will evaluate potential diagnostics found in the literature and will also propose another diagnostic for determining an adverbial's position relative to the VP. The literature will be reviewed in the same order as in the first chapter of this thesis.

2.2.1 Cinque 1999

According to Cinque 1999, VP-internal (pp. 29-30) "circumstantial" adverbials, including "place, time, manner, means, company, reason, purpose, and so forth" (p. 28), have the following five properties (p. 28):

- (7) They are not rigidly ordered;

- (8) They can be found "interchangeably in one another's scope" (p. 28);
- (9) They "typically" (p. 28) appear in PP form or as bare NPs;
- (10) They are unable to occupy the pre-VP positions occupied by non-circumstantial adverbials (with the exception of the initial "topic-like" (p. 28) position); and
- (11) They differ from "AdvPs proper" (p. 28) semantically in that non-circumstantial adverbials function as operators, whereas circumstantial adverbials function as "modifiers predicated of an underlying event variable" (p. 28).

Of these five characteristics, (7) and (8) say essentially the same thing, since Cinque 1999 assumes Kaynian (1994) antisymmetry (and thus that order equals scope). In addition, because determining whether or not VP-internal adverbials are rigidly ordered in English is one of the main purposes of this paper, that characteristic alone cannot be used as a diagnostic test for an adverbial's position in this context. It could, however, potentially be used to confirm that two suspected VP-internal adverbials are indeed event-internal, if the order of those adverbials could be changed without occasioning any difference in scope effects.

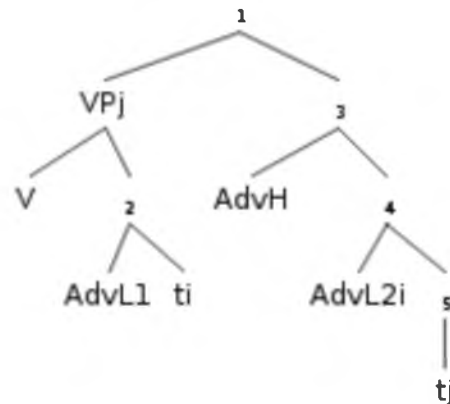
The use of the word *typically* in (9) cancels any possible utility as a diagnostic, because a given adverbial can be definitively neither included nor excluded from the VP based on (9). The trait described in (10) might possibly be applied to determine certain adverbials' position relative to the VP, but two relatively broad exceptions undermine its usefulness: The first is the exception mentioned above, that of the initial domain or topic

position which is apparently open to circumstantial adverbials (p. 28); the second is the subclass of temporal adverbials, which, as Cinque 1999 states elsewhere (p. 15), have some flexibility and can occur both in higher, pre-VP positions as well as in positions after the complement of the V head.

The characterization of circumstantial adverbials described in (11) relies on the predicate modifier account—rather than the operator account—of attributive adverbials being the correct analysis. Cinque specifically cites Parsons 1990, chapter 4, in favoring one analysis over the other. However, in chapter 4, Parsons 1990 states that both analyses are "*equally correct and equivalent*" (p. 44, emphasis Parsons'); both require an additional parameter drawn from context in order to accurately convey the meaning of such adverbials. This discrepancy does not provide any reason to dismiss (11) as a potential diagnostic per se, but does provide impetus to examine (11) more closely before applying it as a diagnostic.

A note: Given the "postcomplement space" (Cinque 1999:13-16) in which VP-internal adverbials are located and from which pre-VP adverbials move to their final positions, a result of Cinque 1999 is the prediction that the following ordering should be impossible: Adv1 (VP-internal adverbial) > Adv 2 (pre-VP adverbial (e.g., *quickly*)) > Adv3 (VP-internal adverbial). If true, this prediction could potentially become a useful diagnostic, but unfortunately it is not necessarily true:

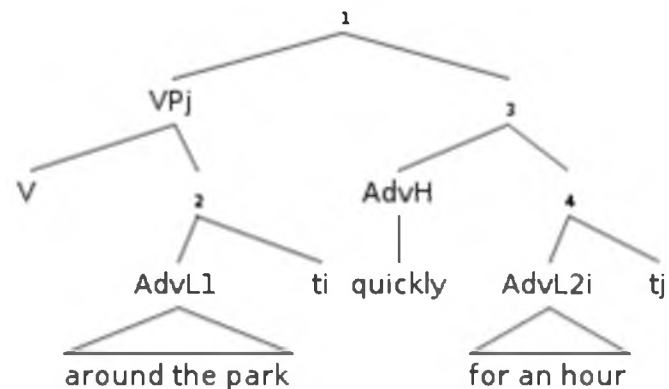
(12)



The tree seen above demonstrates how regular movement could yield a structure of the type predicted not to exist in the postcomplement space (p. 16). Such a sentence, with uncontroversially "low" adverbials such as *around the park* and *for an hour* flanking a "high" celerative adverb *quickly*, is not clearly ungrammatical:

(13) a. ?Jane biked around the park quickly for an hour.

b.



In this structure, AdvL2 first moves to a position above the VP, but below the AdvH. Then the VP moves to a position above the AdvH.

2.2.2 Ernst 2004

Ernst 2004 defines the "Low Range" (p. 756) as follows:

- (14) . . . [S]tarting from the immediately preverbal position all the way to the right in verb-initial languages like English. It is widely recognized that the adverbs inhabiting this zone are all "event-internal" or "verb-modifying" in some way: manner adverbs, measure adverbs like *completely*, domain adverbs such as *politically*, and at least some iterative adverbs, like *again*. The first two of these are restricted to the Low Range . . . , while the other two may also occur in higher positions.

(Ernst 2004:756)

There are two syntactic boundaries described in the definition above, and each proves problematic in some way.

The left part of the range delineated in Ernst 2004 is the "immediately preverbal position" (p. 756). This position is not restricted only to adverbials or adjuncts; it can be occupied by any of several elements of a clause. In addition, this definition allows for only a single preverbal, VP-internal position, whereas it seems likely that multiple VP-internal adverbials could precede the V head. For example, *softly* (p. 756) and *deftly* (p.

762) are both described in Ernst 2004 as being manner adverbials. However, they can cooccur preverbally in a sentence where both are clearly VP-internal:

(15) a. Karen softly, deftly pulled the pot out of the fire.

b. *Karen deftly, softly pulled the pot out of the fire.

Note also that the ungrammaticality of (15b) contradicts the view of Cinque 1999 that conjuncts modifying a Davidsonian (1967) event should be able to be interchangeably ordered.

The Low Range's right edge corresponds with the right edge of the sentence (p. 576), but this part of the definition is also problematic. It seems likely that when so-called higher adverbials like domain adverbials appear in this position, they must be "prosodically detached" (Huddleston & Pullum 2002:580), and thus actually appear high in the syntactic structure. (I assume that adverbials appearing to the right of the V head and which are not prosodically detached are VP-internal.) For example, Huddleston & Pullum 2002 provides this description of the distribution of the domain adverb *politically*, where *x* denotes an acceptable position for that adverb in the linear order of a sentence and ? denotes a questionably acceptable position:

(16) *politically* Domain *x this ? will ? become ? very unpleasant x*

(Huddleston & Pullum 2002:580)

The "prosodic detachment" of the position at the right edge of (16) is typically represented orthographically using a comma:

- (17) a. This will become very unpleasant, politically.
 b. *This will become very unpleasant politically.⁵

Interestingly, it could be argued that domain adverbs appearing at the beginning of a sentence also require prosodic detachment:

- (18) a. Politically, this will become very unpleasant.
 b. *Politically this will become very unpleasant.

When higher adverbs like *politically* do appear within the VP, they must modify other VP-internal modifiers:

- (19) This will become politically very unpleasant.

In (19), *politically* is a modifier in the AdjP headed by *unpleasant*.

Overall, the designation found in Ernst 2004 of the Low Range seems a very arbitrarily defined subsection of the clause. Neither boundary of the range as described in Ernst 2004 provides a concrete enough description on which to base a diagnostic test

⁵ Not all readers may share this intuition, which provides evidence for the limitations of anecdotal data in providing a solid basis for theory.

of a given adverbial's position relative to the VP. However, adverbials at the right edge but not prosodically detached may be considered to be within the VP.

2.2.3 Biskup 2011

An examination of Biskup 2011 does not yield any potentially useful tests for an adverbial's VP-internal status. Biskup 2011 does not define VP-internal adverbials, although it addresses the ordering of two adverbial subtypes: "preverbal" (p. 124) and "circumstantial" (p. 126) adverbials, with the latter including temporal, locative, and manner adverbials (and possibly others) (p. 127). Note that these circumstantial adverbials are a subset of the adverbials described as being circumstantial in Cinque 1999.

2.2.4 Huddleston & Pullum 2002

Huddleston & Pullum 2002, in describing the difference between "VP-oriented" and "clause-oriented" (p. 576) adjuncts, suggests the following "rule of thumb" (p. 576):

- (20) i AdvPs realising VP-oriented adjuncts are more closely associated with the VP constituents, and more likely to be positioned in the VP or adjacent to the VP.
- ii AdvPs realising clause-oriented adjuncts are less closely associated with the VP constituents and less likely to be positioned in the VP or adjacent to the VP.

(Huddleston & Pullum 2002:576)

Huddleston and Pullum note that (20i) makes sense semantically, since VP-oriented adjuncts modify a clause's predicate (p. 576). Unfortunately, (20i) cannot be adapted into a diagnostic test because language like *more likely* and *more closely* renders it too vague to be useful. (In addition, it is either redundant or vague, since no description of the difference between *associated with* and *positioned in/adjacent to* are given, although the former could possibly refer to semantic association and the latter to linear order.) Huddleston & Pullum 2002 also note that an adjunct's relative closeness to the verb in the ordering of a sentence roughly corresponds with its relation to the verb (p. 576). This observation is likely true, but not useful as a diagnostic tool, once again because of its vagueness.

2.2.5 Quirk et al. 1985

Quirk et al. 1985 provides no information regarding adverbial positions within the syntactic tree.

2.2.6 Some notes

Labeling an adverbial as being VP-internal does not necessarily mean that it lies within the maximal projection of the V head, but could mean that the adverbial is found within the structure dominated by the maximal projection of some functional or light verb head above the VP but below some point separating "higher" from "lower" zones. Adverbials found in higher zones are more obviously VP-external, whereas adverbials found within the lower preverbal structure are clearly VP-internal (manner adverbials, for

example). The point separating the two is probably below negation, based on Pollock 1989.

As noted in several places above, "higher" adverbials may be found in VP-external positions toward the right edge of a sentence in English. Assuming

(21) A preverbal ordering something like this:

[*frankly* Mood_{speech act} [*fortunately* Mood_{evaluative} [*allegedly* Mood_{evidential}
 [*probably* Mod_{epistemic} [*once* T(Past) [*then* T(Future) [*perhaps* Mood_{irrealis}
 [*necessarily* Mod_{necessity} [*possibly* Mod_{possibility} [*usually* Asp_{habitual}
 [*again* Asp_{repetitive(I)} [*often* Asp_{frequentative(I)} [*intentionally* Mod_{volitional}
 [*quickly* Asp_{celerative(I)} [*already* T(Anterior) [*no longer* Asp_{terminative}
 [*still* Asp_{continuative} [*always* ASP_{perfect(?)} [*just* Asp_{retrospective} [*soon* Asp_{proximative}
 [*briefly* Asp_{durative} [*characteristically(?)* Asp_{generic/progressive} [*almost* Asp_{prospective}
 [*completely* Asp_{SgCompletive(I)} [*tutto* Asp_{PLCompletive} [*well* Voice
 [*fast/early* Asp_{celerative(II)} [*again* Asp_{repetitive(II)} [*often* Asp_{frequentative(II)}
 [*completely* Asp_{SgCompletive(II)} ; (Cinque 1999:106)

(22) That the order of postcomplement "higher" adverbials should mirror the order of pre-VP adverbials;

(23) That the "cut-off" point between VP-external and -internal adverbials may be found somewhere within the range of habitual-perfect-progressive functional heads, as those heads assign a time interval to the event and are found above heads that assign theta-roles⁶; and

⁶ This parameter is admittedly imprecise; more work needs to be done to determine where exactly the border lies. At this point it is not clear whether all adverbials found below a habitual functional head, specifier, or modifier are truly VP-internal; nor whether all

- (24) That phonological considerations affect whether an adverbial appears pre- or postverbally;

then a pre-VP adverbial's position relative to short adverbs modifying habitual, perfect, or progressive aspects of the predicate—and a postcomplement adverbial's position relative to longer (phrasal) versions of those adverbials—may prove a useful tool in determining whether that adverbial should be considered VP-internal or not. For example, (25) shows that a pre-VP habitual adverb must precede a pre-VP degree adverb, while (26) shows that the inverse is true in the postcomplement space:

- (25) (For context:) Dale likes to prepare well when he knows guests will be coming over.

- a. He always completely cleans the house.
- b. *He completely always cleans the house.

- (26) Dale likes to prepare well when he knows guests will be coming over.

- a. He cleans the house from top to bottom on most occasions.
- b. *He cleans the house on most occasions from top to bottom.

2.3 Ordering⁷

Whether or not VP-internal adverbials' ordering relative to each other is determined by semantic class has been discussed at greater depth in the first chapter; in this section, I will provide a quick overview of VP-internal adverbial ordering in the literature. Detail about the contexts of these orders will not be given; rather the information will be provided as a list of references and the order(s) found in each reference:

⁷ An anecdotal aside about adverbials in prescriptive English grammar: The ordering of adverbials in English is something that most native speakers of English who are younger than around fifty do not recall ever having learned anything about, from a prescriptive perspective. A couple of native English speakers in their fifties and sixties told me that they learned that the proper order for adverbials is:

- (i) time > manner > place

Note the similarity of this order to the following order, relayed to me by a young native speaker of Russian who learned British English in Russia. This order includes a position for the verb:

- (ii) space > time > V > manner > place

Lastly, googling search terms like *adverbial ordering* yields many hits prescribing a mysterious "Royal Order of Adverbs", or less complete variations thereof. The closest I can find to an original source for this order comes from Darling 1996-2005 (<http://grammar.ccc.commnet.edu/grammar/adverbs.htm>, accessed April 12, 2015), which gives the "Royal Order" in (iii), as well as these other orders:

- (iii) manner > place > frequency > time > purpose
- (iv) subset > superset
- (v) shorter > longer

The information in Darling 1996-2005 is presented as descriptive, but seems to be prescriptive in reality. Unfortunately, Dr. Darling left no references on his website and has since passed away, nor do the people currently maintaining the website have any information about his sources. A review of prescriptive grammars intended for use by students learning English as a second or foreign language might yield useful information, but that search is unfortunately outside the scope of this project.

(27) Quirk et al. 1985

- (a) occasion frequency > period frequency (p. 544)
- (b) time duration > time frequency > time position (p. 551)
- (c) respect > process > space > time > contingency (p. 565)
- (d) predication adjuncts > sentence adjuncts (in the part of the sentence roughly corresponding with Ernst's 2004 Low Range) (p. 649)
- (e) subset > superset (intra-class) (pp. 526, 545)
- (f) shorter > longer (p. 649)

(28) Huddleston & Pullum 2002

serial order > other temporal (p. 580)

(29) Nilsen 2000

$PP_{dir/dat/result/depict} / PP_{cloc} > PP_{inst} > PP_{dir/dat} > PP_{tel} > PP_{atel} > PP_{dur} > PP_{ag} > PP_{loc} > DP_{habit} > PP_{temp}$ (p. 133)

(30) Biskup 2011

- (a) temporal > locative > manner (p. 127)
- (b) superset > subset (intra-class) (p. 127)

(31) Adger & Tsoulas 2004

manner > locative (p. 62)

CHAPTER 3

METHODOLOGY

The goal of the experimental part of this project is to determine what part—if any—semantic type plays in the ordering of VP-internal adverbials and, secondarily, to examine how phonological weight (measured in number of syllables) interacts with semantic type to influence adverbial positioning. Regrettably, due to time constraints, an experimental exploration of the exhaustive list of VP-internal adverbials is outside the scope of this thesis project. However, this chapter will describe some general considerations relevant to the experimental study of the ordering of VP-internal adverbials, as well as the methodology used in investigating the first set of adverbial combinations in an ongoing study of the grammaticality of orderings of VP-internal adverbial pairs. (Results of that initial study set will be discussed in Chapter 4.)

3.1 General considerations

Eliciting grammaticality judgments from subjects in order to draw conclusions about syntactic structure is not a new approach to syntax, but attempting to do so according to the formal scientific and statistical parameters that would be considered standard in, for example, psychology research has not become the prevailing practice in the field of syntax. Schütze & Sprouse 2011 characterizes the debate between formal and

informal approaches to experimental syntax as a matter of practicality—i.e., if the results of informal studies mirror (and can thus predict) the results of formal studies, which in some cases they do (p. 5), then why go through all the time and trouble to perform a formal study (p. 4)? In areas of syntax where formal and informal studies have already been shown to yield similar patterns of grammaticality judgments, then this approach makes sense. The problem is that until small, informal studies' ability to predict the results of more formal studies has been well established empirically across most areas of syntactic research, it seems foolhardy to assume that this will be the case for any given area of large and diverse field. Although the end results may be the same, I argue that taking that risk without knowing the outcome demonstrates a wanton disregard for the facts about native speakers' intuitions, and thereby for the soundness of any resulting theory. Further, with respect to the issue at hand, there is no consensus in the literature as to the facts of adverbial distribution in the VP (see section 1.2).

A careful search of the literature reveals no formal studies of native English (or other languages') speakers' judgments about adverbial ordering, and thus, of course, no comparisons of the results of informal and formal studies of the same or even of related phenomena. Therefore, I have chosen to adopt a formal, statistically rigorous approach to ascertaining the ordering of VP-internal adverbials in English. There are obvious limitations to this approach—most notably the high ratio of time and effort demanded to potentially useful results yielded—but it seems reasonable to demand that a claim to knowledge about adverbial distribution facts be supported by evidence.

3.2 Experimental design

There are many factors involved in designing a grammaticality judgment study, according to Schütze & Sprouse 2011; the type of task chosen (p. 6), the instructions (p. 11), materials (p. 12), sample size (p. 14), participants (p. 16), analysis (p. 17), and interpretation (p. 20) are all important aspects for researchers to consider. The methodology of this study of English adverbial ordering will be described according to these considerations, with interpretation discussed in the next chapter. A script of the entire pilot questionnaire, including IRB consent form, instructions, and training items, is available as Appendix B.

3.2.1 Likert scale task

A Likert scale task, in which subjects were asked to rate a stimulus on a four-point scale ranging from 'Very unnatural' through 'Somewhat unnatural' and 'Somewhat natural' to 'Very natural', was chosen for its ability to yield information about the relative grammaticality of different stimuli, given appropriate statistical analysis. As Schütze & Sprouse 2011 points out, a Likert scale task is also easy for respondents to understand and use (p. 8).

Although Likert scales typically use an odd-numbered scale, an even-numbered scale can be employed, and in this case, doing so produces two clear benefits: a) it potentially allows for a smaller sample size to be used to obtain significant results; and b) it encourages respondents to make a real judgment about the grammaticality of each stimulus (although they do have the option to advance to the next question without making a choice) (Greg Stoddard, p.c., February 3, 2015). In addition to discouraging

participant "laziness" (Stoddard, p.c., February 3, 2015), making use of an even-numbered scale keeps the scale unidimensional, or measuring only one thing. I.e., when respondents interpret the middle option of an odd-numbered Likert scale as something like a 'cannot decide' option, in those cases, the scale no longer measures simply the perceived grammaticality of stimuli, but also whether or not respondents are able and/or willing to make a judgment about the perceived grammaticality of the stimuli (Stoddard, p.c., December 1, 2014).

3.2.2 Instructions

The instructions and training items were constructed so that respondents would understand not only that the researchers were interested in their intuitions about how natural each sentence sounded, but also that the researchers were explicitly not interested in things like "violations of prescriptive grammar rules, the likelihood that the sentence would actually be uttered in real life, and the truth or plausibility of its content" (Schütze & Sprouse 2011:11).

3.2.3 Materials

The questionnaire included thirty-two test items, six control items, and twenty-four filler items in addition to five training items and three ending questions gathering language background information and soliciting feedback and comments. Control items were included to identify both non-native English speakers as well as distracted, tired, or otherwise not-fully-attendant native English speakers, so that data from such respondents could be excluded. The twenty-four filler items came from a different study that used a

similar question format (Aniko Csirmaz, p.c.). All items, with the exception of the three language-background and feedback-solicitation items, had the same format: A one- or two-sentence long situation was described, and then the test sentence was presented. Respondents were asked to rate how natural or appropriate the sentence sounded, given the situation described. Each situation was constructed to encourage a prosodically neutral reading of the test sentence.

The questionnaire was built using Qualtrics (Qualtrics 2015). The five training items were presented on the same page as the instructions. A pseudo-randomized set (Cowart 1997:98-101) of five items including one control, two filler, and two test items was presented next, followed by the rest of the items (except the language-background and feedback items), which were randomized. The three language-background and feedback-solicitation items were presented last.

Adverbial test items were constructed in sets of eight. The eight sentences were identical except for the adverbials; each set of eight sentences included all possible combinations and orders of adverbials from two different semantic subclasses (for example, locative and durative) and two lengths (short and long, measured in number of syllables). The short variations of each of the two semantic subclasses had the same number of syllables as each other, as did the long variations. The difference in number of syllables between long and short variations was at least three syllables. So, for example, the following situation was presented eight different times:

- (1) Situation: Gertrude's aunt gave her a box of sidewalk chalk for her birthday.

The next day, she went outside to try out the new chalk.

The test sentences associated with that scenario each contained a locative (*in front of her house* (short) or *in front of her next-door neighbors' house* (long)) and a durative adverbial (*for over an hour* (short) or *for almost an entire afternoon* (long)). The short versions of each adverbial have five syllables while the long versions have nine. Each of the following sentences was seen exactly once:

- (2) a. Gertrude drew pictures for over an hour in front of her house.
- b. Gertrude drew pictures for over an hour in front of her next-door neighbors' house.
- c. Gertrude drew pictures for almost an entire afternoon in front of her house.
- d. Gertrude drew pictures for almost an entire afternoon in front of her next-door neighbors' house.
- e. Gertrude drew pictures in front of her house for over an hour.
- f. Gertrude drew pictures in front of her house for almost an entire afternoon.
- g. Gertrude drew pictures in front of her next-door neighbors' house for over an hour.
- h. Gertrude drew pictures in front of her next-door neighbors' house for almost an entire afternoon.

This set of test items includes both possible orders of each available combination of adverbials, given the variables under investigation. The adverbials in this set as in other sets were all placed at the right edge of the sentence in order to avoid the possible confounding variable of interaction with other parts of the sentence.

Each subject saw two different sets of adverbial combinations, and two sets of eight sentences for each combination. So, in the pilot study, each subject saw a total of sixteen sentences containing a locative and a manner adverbial, and sixteen sentences containing a locative and a durative adverbial. In the main study, subjects will see other combinations of adverbials, but will still see sixteen of each combination, divided into two sets of eight. Assuming that enough willing participants can be found, the main study will examine eight to ten different subclasses of VP-internal adverbials in order to provide a rough framework of the ordering of VP-internal adverbials.

Several factors were considered in deciding which adverbials to include. One of the purposes of the pilot study was to perform a power calculation to determine sample size for the main study; thus, one consideration unique to the pilot study was that there should be as little difference in the perceived grammaticality of different orders as possible. Out of the possible combinations of two different semantic subclasses from among the list of VP-internal adverbials, two combinations which were found to be relatively equally grammatical in either order were manner and locative adverbials and locative and durative adverbials.

Another factor in choosing adverbials arises from the fact that some kinds of constructions are naturally more marked than others. Quirk et al. (1985) observe that a construction with two *-ly* adverbials immediately cooccurring is very marked (p. 649); yet the non- *-ly* versions of many manner adverbials intuitively seem more marked than the simple adverbs themselves:

(4) a. carefully

b. ?with great care (when compared with *carefully*)

The result is that, though it would be less marked to use *surgically* and *dextrously* individually as means and manner adverbials, respectively, when used together, they are extremely marked and so the potentially more marked adverbial versions (e.g., *through surgery* and *with dexterity*) must be used instead.

Some semantic subclasses lend themselves more easily to this project than others. For example, means/instrument adverbials raise problems in a couple of different ways: First, some means/instrument adverbials seem to be more easily read as "higher" adverbials when they appear at the right edge of the sentence. *Logically*, when it appears at such a position, could be read as a means/instrument adverbial, but could just as easily be read as a domain or evaluative adverbial. In addition, in constructing longer examples of means/instrument adverbials, it is tempting to use a verb form within the adverbial (e.g., the present participle in *by using logic*), but this kind of construction should be avoided because any adverbial following it could be read as being embedded within the means/instrument adverbial:

(3) Kathleen emptied the cup by using a spoon carefully.

Alternatives to *by using a spoon* that do not contain a verb are not difficult to find, but the point is that, in order to make sure that the questionnaire actually tests what it purports to test, all possible confounding variables should be eliminated.

3.2.4 Sample size and participants

The sample size of the pilot study was thirteen subjects, after a few subjects were excluded for failing more than one control item. Participants were all native speakers of English over the age of eighteen; participants were invited by the researchers to take part in the study, but were not offered any kind of compensation. Whether grammaticality judgment study participants should be linguists or non-linguists is a matter of current debate among experimental syntacticians (Schütze & Sprouse 2011, Culbertson & Gross 2009); in any case, this pilot study's subject pool included both linguists and non-linguists, in roughly equal numbers.

3.2.5 Analysis

For the statistical design of the study, I relied on the expertise of Greg Stoddard, co-director of the University of Utah Study Design and Biostatistics Center. Please see Appendix C for his description of the statistical methods he used in this pilot study (Stoddard, p.c., April 15, 2015).

CHAPTER 4

RESULTS AND ANALYSIS

This chapter discusses the results and limitations of the pilot study of adverbial ordering, as well as the implications of the results for the main study, for future research, and for the syntactic and semantic theory of adverbial ordering in English.

4.1 Results and discussion

Data gleaned from the pilot study were analyzed according to the methodology found in Appendix C (G. Stoddard, p.c., April 15, 2015). For each ordering, odd ratios expressing the likelihood that that ordering would be found to be more (or less) grammatical than each other order were calculated. There were sixteen orderings, so for each ordering, there were fifteen odds ratios calculated. Odds ratios with a corresponding *p* value of less than or equal to 0.05 were considered to be statistically significant, and those ratios were used to construct the list of relationships in Appendix D. Some of the relationships were between orders testing different semantic classes from each other; those relationships do not show anything generally of interest to the study at hand. However, relationships between orders testing the same semantic classes are summarized below in (1), where ">" = "more grammatical than", and each ordering is coded as follows: Each ordering consists of two adverbials, represented in the order in which they

were presented in the test sentences. A capital *S* or *L* indicates whether the adverbial was short or long, and the three letters following the *S* or *L* indicate the semantic subtype; *man* indicates a manner adverbial, *dur* a durative adverbial, and *loc* a locative adverbial. Thus, *Sloc Sman* > *Lloc Lman* indicates that sentences with a short locative adverbial preceding a short manner adverbial are more grammatical than those in which a long locative adverbial precedes a long manner adverbial.

(1) Summary of statistically supported ordering preferences and possible

implications:

- a) *Sloc Sman* > *Lloc Lman*: evidence for relative unmarkedness of shorter constructions
- b) *Sloc Lman* > *Lloc Lman*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for short-long order
- c) *Sloc Sdur* > *Sloc Ldur*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence against short-long order
- d) *Sloc Sdur* > *Lloc Sdur*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence against long-short order
- e) *Sloc Sdur* > *Lloc Ldur*: evidence for relative unmarkedness of shorter constructions
- f) *Sloc Sdur* > *Sdur Sloc*: evidence for locative-durative order
- g) *Sloc Sdur* > *Sdur Lloc*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for locative-durative order; and/or
iii) evidence against short-long order
- h) *Sloc Sdur* > *Ldur Sloc*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence against long-short order; and/or
iii) evidence for locative-durative order
- i) *Sloc Sdur* > *Ldur Lloc*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for locative-durative order
- j) *Lloc Sman* > *Lloc Lman*: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for long-short order

- k) Sman Sloc > Lloc Lman: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for manner-locative order
- l) Sman Lloc > Lloc Lman: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for short-long order; and/or
iii) evidence for manner-locative order
- m) Sman Sloc > Lman Sloc: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence against long-short order
- n) Sman Sloc > Lman Lloc: evidence for relative unmarkedness of shorter constructions
- o) Sman Lloc > Lman Sloc: evidence for short-long order
- p) Sman Lloc > Lman Lloc: i) evidence for relative unmarkedness of shorter constructions; and/or
ii) evidence for short-long order

This list also indicates possible implications of each relationship, based on the differences between the two orderings in the relationship. For example, the only difference between the two orderings in (1a) is in length of the adverbials, where the more grammatical structure contains two short adverbials instead of two long adverbials. This preference provides evidence that, in general, shorter adverbial construction is less marked than longer adverbial construction.

There were three main possible independent variables manipulated in the test items: order, semantic subtype, and phonological length. Where an ordering different in multiple ways from another ordering is found to be more grammatical than that second ordering, it is impossible through the present analysis to separate the interactions of the various variables and pinpoint exactly from which variable or variables arises the difference in grammaticality. So, for example, the grammaticality relationship in (1g) is consistent with a preference for locative-durative order over durative-locative order, but it

is entirely possible that the grammaticality effects arise solely from the difference in overall length of the sentences (one long adverbial versus none), or from a preference against short-long ordering, or—more likely—from some interaction of two or more of those factors. Whether or not a more in-depth analysis parsing these interactions is even possible from the results of this pilot study is not clear, but in any case, such an analysis is outside the scope of this project.

That being said, however, it is still possible to draw some interesting conclusions from the pilot study results: There is evidence showing the following:

- (2) a) The short-long order is generally less marked than the long-short order (1o), and
- b) The locative-durative order is generally less marked than the durative-locative order (1f).⁸

In addition, the results demonstrate the necessity of including a fourth (unanticipated) variable among the factors yielding grammaticality effects—viz., whether or not there was a difference in the total phonological length of adverbials between one ordering and another. The study was constructed in part to determine if there is a difference between short-long and long-short orderings of adverbials, but in the interest of thoroughness, all possible combinations of lengths were tested, yielding very strong evidence of the following:

⁸ Note that no conclusions about the position of manner adverbials relative to other adverbials could be drawn. See p. 58 for further discussion.

- (3) Shorter, less complex adverbial constructions are generally less marked than longer, more complex adverbial constructions (1a, e, and n).

It appears that the effect on perceived grammaticality of total phonological complexity of the AdvPs together is much stronger than initially anticipated. Note that among all the statistically significant results showing grammaticality relationships between adverbial orderings using the same semantic classes (1), no grammaticality relationship is consistent with a preference for longer, more complex constructions; on the contrary, every single relationship between sentences where there is a difference in total phonological complexity is consistent with a preference for shorter, less complex adverbial constructions. Again, it is impossible to pinpoint precisely how much each factor out of two or more factors contributes to the grammaticality relationship, but the fact that there is no possible evidence to support a preference for more phonologically complex constructions and on the other hand there are three separate relationships providing positive evidence for a preference for shorter constructions is compelling and unexpected.

Another unexpected result of the study is that the overall grammaticality of orderings with locative and manner adverbials is less, on average, than that of orderings with locative and durative adverbials (2.9 compared with 3.6, with $p = 0.05$, where Likert scale values are assigned numerical values such that 1='very unnatural' and 4='very natural'). Note also that while the study results yield the conclusion in (2a), viz. that the locative-durative order is more grammatical than the inverse, no such conclusion about the ordering of manner and locative adverbials may be drawn definitively. Anecdotally,

sentences with phrasal manner adverbials in any postverbal position are significantly marked in comparison with otherwise identical sentences containing simple manner adverbs in an immediately preverbal position.⁹ In addition, common consensus designates the immediately preverbal adverbial position as the location where adverbials of manner (and also degree) are normally found (Cinque 1999:11, Ernst 2004:762, Quirk et al. 1985:494), whereas the positioning of other VP-internal adverbials is not described in relation to the verb. Thus, I tentatively conclude that the test items containing manner adverbials (all of which were phrasal and postverbal) may have been penalized against the perceived but unpresented "default" of simple, preverbal manner adverbs, and those data correspondingly muddled beyond the possibility of drawing any conclusions about order.

4.2 Limitations

There are natural limitations to what this study can show; these limitations stem primarily from the scope of the study in several respects. As discussed in Chapter 3, one of the main purposes of the pilot study was to obtain information needed to perform a power calculation for the main study; thus, the combinations of adverbials used in the pilot study (locative and manner, locative and durative) were chosen because the differences in grammaticality between the two different orders of each combination of adverbials of semantic types (e.g., locative > manner and manner > locative) were perceived to be minimal compared with the differences perceived between the different orders of other combinations of adverbials. The power calculation was successful, but

⁹ Thanks to L. Anderson for grammaticality judgments in the study design phase.

the point here is to explain that while statistically significant, the results of the pilot study are necessarily modest in terms of the types of conclusions that can be drawn about adverbial ordering, testing only two different combinations of semantic subtypes and obtaining significant results about only one. It is reasonable to expect that the results of the main study will reveal much more about English adverbial ordering within the VP.

Another limitation of the study arises from the fact that considerations of prosody were ignored in the research design. It is possible to put an adverbial which would not normally be considered grammatical in a sentence-final position in such a position if the adverbial is "prosodically detached" (Huddleston & Pullum 2002:578) from the rest of the clause. This study aims to examine only the default structure and ignores structures made possible through variations in prosody. Thus, the findings of this study are limited to interpretation only in light of the default clause structure; in addition, it is possible that the grammaticality relationships described above (1) could be affected by subjects' spontaneous reading of test items as containing prosodically detached structures. Although prosodically detached structures are commonly orthographically represented by a comma (Huddleston & Pullum 2002:578), and the test items contained no punctuation between the verb and the right edge of the sentence, it is possible (though unlikely) that some subjects' grammaticality judgments may have been affected by such a reading.

The strict limitations on the kinds of adverbial semantic subtypes and structures available for use in this study, discussed in detail in section 3.2.3, place natural restrictions on the ability to interpret the study as a whole. Although every attempt was made to account for this effect, an adverbial used in the study might not be overall the most natural (least marked) way to express a given idea. Thus, there is the possibility

that the grammaticality judgments on sentences containing inherently more marked structures show a penalty for containing those structures above or in addition to the effects arising from manipulation of the independent variables. Likewise, other possible sources of grammaticality effects (e.g., word choice) may have had an unforeseen influence on the results.

An important general limitation to the study design resides in the fact that, although reliance on anecdotal data undermines the strength of any resulting theory (as discussed in the third chapter), at some point, such data must be considered in order to have a starting point from which to build a more rigorous study. In this case, anecdotal data were used in the process of designating VP-internal adverbials and selecting combinations of adverbials to be tested. Although I believe any resulting risk to the theoretical implications to be negligibly low, it must nevertheless be acknowledged.

4.3 Implications

Despite the limitations of the study, the results bear theoretical implications as well as implications for future experimental research.

4.3.1 Theory

The results of the pilot study generally show that none of the theories examined in the first chapter by itself adequately captures the entire picture of the phenomenon of VP-internal adverbial ordering, but several of them contribute useful pieces to the whole.

Although not the main point of the study, the effect of phonological "weight" is an interesting and significant part of the results. The finding that short-long adverbial

ordering in English is generally more grammatical than long-short adverbial ordering is predicted by Ernst 2004:771; what is unexpected is the strength of the negative effect on a sentence's perceived grammaticality that having more complex adverbials has, period. Whether the markedness springs from syntactic, semantic, or phonological complexity is not clear. In addition, the phonological effects on adverbial placement pose a problem for a Cinque 1999-type analysis of adverbial positional licensing.

The primary purpose of the study is to look at the syntax and semantics of adverbial ordering, determining whether VP-internal adverbials are actually ordered based on semantic subclass. This study's finding that a locative-durative order is perceived as being more grammatical than a durative-locative order of VP-internal adverbials indicates that at least some VP-internal adverbials are indeed ordered, in contradiction of Cinque 1999:28. The FEO Calculus approach proposed by Ernst 2004:761ff is too broad to characterize the semantic distinction between locative and durative adverbials, in that both types of adverbials can combine with SpecEvents; a finer-grained semantic distinction is needed to explain the locative-durative ordering.

The theoretical approach to adverbial ordering perhaps most closely supported by the data presented here is the approach found in Nilsen 2000, which offers an analysis of VP-internal adverbial PPs (and only PPs—pure adverbs are not addressed) as "reduced relative clauses" (p. 92ff) that take functional projections as their arguments. This approach extends the functional hierarchy of Cinque 1999 (and in general, other feature-based syntactic approaches such as Alexiadou 1997 and Laenzlinger 2002) into the VP, consistent with the data showing that VP-internal adverbial ordering exists. In addition, the ordering is based on semantic class in a way that is not feature-based and thus not

susceptible to the kinds of problems pointed out by Abels 2003 (see section 1.2.4 for the discussion of these problems via Biskup 2011). The advantage of this analysis with respect to the pilot study results is that it accounts for the fine distinctions among semantic subclasses as well as the fact of VP-internal adverbial ordering in general.

However, the results of the pilot study pose problems for this approach as well: Specifically, there is the finding that the more grammatical order of postverbal adverbial PPs in English is locative-durative rather than durative-locative. This finding is problematic in that the ordering alleged for Norwegian postverbal adverbial PPs is durative-locative, where a durative adverbial is structurally higher (Nilsen 2000:133, 153); the discrepancy either demonstrates the necessity of obtaining experimental data before asserting facts about grammaticality or it undermines the assumption that the hierarchy is a part of UG.

A lingering challenge to the account in Nilsen 2000 is that it cannot explain how or why the semantic characteristics of adverbials influence syntactic position at all. This problem is not specific to the analysis in Nilsen 2000 or indeed to any other of the approaches to adverbial ordering inside or outside the V discussed in this thesis; rather, it seems to be a problem relating generally to the mechanisms of syntactic derivation standardly assumed in GB (Chomsky 1981) and Minimalism (Chomsky 1993): There is simply no way to account for the fact that semantic subclass decidedly plays a role in determining adverbial ordering—and even adverbial position with respect to other elements in the clause, if it turns out that manner adverbials are somehow fixed (or more grammatical) in the position preceding the verb than in other positions—without resorting to stipulative assumptions of some sort.

One possible solution might be found in Williams 2013, which proposes that rather than the syntax acting as the single "generative engine" (p. 79) producing structures interpreted at morphosyntax and semantics, there are dual generative functions that produce structure and meaning simultaneously. A close look at whether this system, called Generative Semantics, Generative Morphosyntax (GSGM) can derive the English adverbial ordering facts is outside the scope of this project, but it can derive the ordering of a pair of apparently VP-internal adverbials in Greek (p. 92).

In any case, the results of the pilot study on VP-internal English adverbial ordering suggest the need for further investigation into the facts of adverbial ordering, as well as possible revision of the theory of syntactic and semantic derivation to accommodate these facts.

4.3.2 Future research

The results of this study suggest several different courses of future research. The most obvious, immediate priority is to perform the main study following the success of the pilot study presented here. The main study will investigate more combinations of VP-internal adverbials in order to be able to present a definitive ordering of VP-internal adverbials in English. Another obvious route of exploration would be to try to parse the influence of the various factors contributing to a structure's perceived grammaticality. Now that there is a general sense of the importance of phonological complexity on the grammaticality of adverbial structures, more examination of adverbials' interactions with and without phonological controls should yield better understanding of the scope of an adverbial's semantics on its position in the clause structure, versus that of phonological

considerations. In addition, more investigation into the nature of the behavior of specific subclasses of adverbials (e.g., spatial PPs, manner adverbials) might prove an interesting and productive area of research.

On the side of theory, another inviting course of research would be to evaluate whether GSGM (Williams 2013) can account for the ordering of English adverbials, and if not, what revisions to GSGM or Minimalism (Chomsky 1995) would be necessary to allow that derivation in the absence of stipulative assumptions.

4.4 Conclusion

The experimental data reported in this project suggest that current theories of adverbial ordering within the VP are inadequate to explain the facts. The data show first and foremost that at least some VP-internal adverbials in English are ordered relative to each other; and in addition, that phonological "weight" both adds a tendency for an adverbial to gravitate towards the sentence's right edge and also significantly detracts from its perceived grammaticality. In general, more investigation of these and related phenomena is required in order to be able to paint a complete picture of VP-internal adverbial ordering.

APPENDIX A

ADVERBIAL CLASSES

Source	Page(s)	Superclass	Adverbial class	Subclass	Example(s)
Quirk et al. 1985	479-480	space	position	stasis	on his bed
				motion	in the park
Quirk et al. 1985	480-481		direction	directional, no location specified	westwards
				directional, location specified	down the hill
					towards the sea
			goal		to the bus stop
			source		from the school
			distance		a long way
					for fifty kilometres
					far
Quirk et al. 1985	481; 581-582(?)	time	position	temporally fixed	on Sunday, just, just now
					last week
Quirk et al. 1985	481-482		duration	forward span	till next week
					until the following spring
				backward span	since last week
					since the previous September
	; 581-582			general duration	for three weeks, enough, a little, a lot [for a long time]
Quirk et al. 1985			frequency		how often
	543			high frequency	frequently, often, regularly
	543; 581-582			low frequency	rarely, seldom, never, hardly ever

	542			definite, period frequency	hourly, daily, quarterly, annually, every other week
	543			definite, occasion frequency	once, twice, on five occasions
				indefinite, usual occurrence	commonly, customarily, generally, habitually
				indefinite, continuous/continual/universal frequency	always, constantly, incessantly, permanently, continually, continuously
Quirk et al. 1985	; 579-581		relationship		still, any longer, any more, no longer, no more
					already
Quirk et al. 1985	482-483; 557	process	manner		casually, coldly, indiscriminately, categorically, like an expert, thoroughly, in a carefree manner, loudly, as I tell you to
					with deference
					carefully
					slowly
					like John
					just as John does
	;559		means		by bus, intonationally, surgically, by car
					in mathematics
					through insight

			instrument		with a fork, microscopically , with that knife, with a bullet
					using a dictionary
					by means of interrogation
			agentive		by John (with passive), by a terrorist, by millions, by those sitting at the back
Quirk et al. 1985	483- 484; 563	respect			so far as travelling facilities are concerned, formally, legally, on legal issues, with respect to law, from a legal standpoint, about matters of law
					with respect to the date, [fond/frightene d] of cats, [good/skilled] at drawing, [keen/adamant] on moral standards
					with his book
					about Kant
					[frightened] of earwigs
					[advising me] legally
					[died] peacefully
					[working] in a factory

					[split their sides] laughing
					[is busy] writing
Quirk et al. 1985	484-485; 564	contingency	cause		of cancer, because of his insistence, on account of their high mortgage payments, for his son, out of charity, for fear of heart disease, from malnutrition, for this production, etc.
					out of a sense of duty
			reason		because of his interest in metaphysics
			purpose (overlaps with reason)		so as to study metaphysics
			result		so he acquired some knowledge of metaphysics
			condition		if he reads the book carefully
			concession		though he didn't read the book
					because of his enthusiasm
					in spite of his enthusiasm
					through his lack of enthusiasm
					despite his lack of enthusiasm

Quirk et al. 1985	485-486	degree			(very) much, a lot
			amplification		badly
					increasingly
			diminution		not . . . (very) much
					a little
			measure		more than his sister does
					sufficiently
Quirk et al. 1985	583-585	emphasizers	subjunctive asseveratives		[I told them to] darned well [go]
					[I told them to get their car] the hell [out of my]
	590-593	intensifiers	amplifiers	maximizers	altogether, completely, entirely, extremely, most, in all respects, etc.
				boosters	enormously, far, greatly, heartily, deeply, well, a great deal, a good deal
	597-599		downtoners	approximators	almost, nearly, practically, virtually
				compromisers	kind of, sort of, quite, rather, enough
				diminishers, expression	mildly, partially, partly, quite, slightly
				diminishers, attitude	only, merely, simply, just, but
				minimizers, negative	barely, hardly, little, scarcely

				minimizers, nonassertive	in the least, in the lightest, at all, a bit
Huddleston & Pullum 2002	579		manner		erratically
			means		arithmetically
			act-related	volitional	deliberately, intentionally
			degree		almost, nearly, quite
					thoroughly, enormously, greatly
Huddleston & Pullum 2002	580		temporal location		earlier
			duration		temporarily
			aspectuality		already
			frequency		often
			serial order		last, next, first, again

APPENDIX B

QUESTIONNAIRE SCRIPT

Consent Block

The purpose of this research study is to gain greater understanding of how certain types of sentences are perceived by speakers of English. We are doing this study because of the potential for adding to our knowledge of English grammatical structure.

In this study, you will be asked to read a series of sentences, assigning each sentence a rating based on your opinion about how natural/acceptable or unnatural/unacceptable it sounds. You will then be asked to answer a few questions about your language background. Participation in this study is restricted to people 18 years of age and older. Your participation should take about 30 minutes. There are no anticipated risks of participating in this study beyond what you would encounter in everyday life.

If you have any questions or complaints or if you feel you have been harmed by this research please contact Christina Yong by email at cmy1 (at) utah (dot) edu or Dr. Aniko Csirmaz at aniko (dot) csirmaz (at) utah (dot) edu, or at the University of Utah Department of Linguistics, (801) 581-8047.

Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

It should take approximately 30 minutes to be in this study. Participation in this study is voluntary. You can choose not to take part. You can choose not to finish the questionnaire or omit any question you prefer not to answer without penalty or loss of benefits.

By clicking on the button below, you are indicating that you are at least 18 years of age and that you consent to participate in this study under the terms described above.

Thank you for your participation in this study!

Instructions & Training Items Block

In this questionnaire, you will be asked to judge how natural or appropriate a sentence sounds in a particular context. You will be presented with a short description of a situation and then another sentence that relates to the situation described. You will then be asked to rate how natural or appropriate the sentence is for the situation shown above the sentence. Here 'natural or appropriate' means how much the sentence sounds like something a native speaker of English might say (with respect to the given context). Please try to focus on the overall sentence structure, not on individual words. After reading the situation and the sentence, please select 'Very natural', 'Very unnatural', or any value in between. You will be asked to provide a rating for all sentences. For your rating, rely only on your intuitions about whether the sentence you read sounds like a natural English sentence in the situation described. Don't worry about grammar rules and other rules taught in school. There are no right or wrong answers; we are interested only in your intuitions, so please try to rate the sentences quickly, without too much thought.

The rating scale remains the same throughout the study, but the following key will be

reproduced on each page for you to refer to if needed:

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

The questionnaire will probably take about 30 minutes or less to complete. Please note that you are free to quit the questionnaire at any time, but only completed questionnaires will provide usable data. As noted above, it is best if you proceed quickly through the questions, but if you need to stand up, stretch, or move away for a brief break during the questionnaire, please feel free to do so.

Before starting the questionnaire, you will see five training items similar to what you might see in the questionnaire; please rate each training item. After you select a response to each training item, you will see some comments appear that will help you understand how to respond to the test items once the questionnaire begins. If you do not understand the rating scale or the instructions, or if you have questions about any of the sentences, please refer to the rating scale description above or contact the experimenter. Thank you for your participation!

Please rate each of the following training items, and read the comments that appear.

Training Item 1

Situation:

Before Christmas, the adults baked cookies and wrapped presents.

Sentence:

The children decorated sparkling ornaments onto the tree.

How natural or appropriate does the sentence sound?

Very unnatural

☐

Somewhat unnatural

☐

Somewhat natural

☐

Very natural

☐

In answer to the question above, most native speakers of English would answer 'Very unnatural' or perhaps 'Somewhat unnatural' because although the meaning of the sentence is clear, most native English speakers would not say it that way.

Training Item 2

Situation:

The dodo hosted a gathering for his friends. The manatee danced while the green hen played jazz on the trumpet.

Sentence:

The purple elephant played chess with the balding porcupines.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Despite the implausibility of the scenario, most English speakers would rate the sentence as 'Very natural', meaning that it sounds like an acceptable sentence in English.

Training Item 3

Situation:

John was reading a book that Steve found interesting. When he was done, John gave Steve the book.

Sentence:

Steve stole John's book.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Given the situation described, most English speakers would rate the sentence 'Very unnatural' because the meaning of the sentence does not fit (and actually contradicts) the description of the situation.

Training Item 4

Situation:

Carla went to an ice cream shop to get a scoop of ice cream. That day, the shop had both of her favorite flavors of ice cream.

Sentence:

Carla couldn't decide which flavor to ask for.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Although you may have learned in an English class that it is not grammatically "correct" to end a sentence with a preposition, most English speakers would actually rate the sentence above as 'Very natural' because it sounds like something a native English speaker might say. Remember that there are no right or wrong answers to these questions; we are only interested in your intuitions about these sentences.

Training Item 5

Situation:

Lucy drove her motorcycle south from Alaska along the west coast over the summer, reaching Tijuana by mid-August.

Sentence:

Thence she hied herself home to Idaho, lest the new term begin and she be yet abroad.

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

The language used here would be rated 'Very unnatural' by most native speakers of English because it is archaic or old-fashioned; it is very difficult to imagine any modern native English speaker using this sentence.

While answering questions, keep in mind that there is no right or wrong answer. We are

interested solely in your intuitions about how natural or appropriate the sentences sound.
The questionnaire will begin now.

Atelic reading 1

Situation:

Marie was cleaning the kitchen. She started scrubbing the countertop, but no matter how hard she scrubbed, it stayed dirty.

Sentence:

Marie polished the countertop.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Atelic reading OK 2

Situation:

John was at the edge of the wilderness. He knew that it was huge and that he would not be able to get to the other side. Still, he had a chance to explore the wilderness while he was hiking there.

Sentence:

John walked through the wilderness.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Control 4**Situation:**

The family is sitting around the dinner table getting ready to eat when suddenly a knock is heard at the front door.

Sentence:

There seems to be someone at the door.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A3

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine in the crowded municipal pool with extreme focus.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A9

Situation:

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room rug.

Sentence:

The kittens frolicked with great glee on the rug.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Ambiguity test, contradiction 1

Situation:

Joe lives in a city which lies on two sides of a river. Today he had to deposit some money in his account.

Sentence:

Joe went to the bank, but he didn't go to the bank.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Ambiguity test, contradiction 2

Situation:

Justin was standing in a room with a big box. He touched the front of his upper body.

Sentence:

Justin touched his chest, but he didn't touch his chest.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A1**Situation:**

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine in the public pool with extreme focus.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something

like this.

Adverbial A2

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine in the public pool with an extremely intense focus.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A4

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine in the crowded municipal pool with an extremely intense focus.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A5

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine with extreme focus in the public pool.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A6

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine with extreme focus in the crowded municipal pool.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A7

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine with an extremely intense focus in the public pool.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A8

Situation:

Glenda was planning to enter a creative swimming competition. She came up with a routine and was determined to win.

Sentence:

She practiced her routine with an extremely intense focus in the crowded municipal pool.

How natural or appropriate does the sentence sound?

Very unnatural

☐

Somewhat unnatural

☐

Somewhat natural

☐

Very natural

☐
Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B1

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike for an hour in the park.

How natural or appropriate does the sentence sound?

Very unnatural

☐

Somewhat unnatural

☐

Somewhat natural

☐

Very natural

☐
Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B2

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike for an hour in the cool, shady park.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B3

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike for forty-five minutes in the park.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B4

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike for forty-five minutes in the cool, shady park.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B5

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike in the park for an hour.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B6

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike in the park for forty-five minutes.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B7

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike in the cool, shady park for an hour.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B8

Situation:

Fred had the day off. He decided to go to a nearby park for awhile.

Sentence:

He rode his bike in the cool, shady park for forty-five minutes.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A10**Situation:**

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room carpet.

Sentence:

The kittens frolicked with great glee on the magenta carpet.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A11**Situation:**

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room rug.

Sentence:

The kittens frolicked with great enthusiasm on the rug.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A12

Situation:

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room carpet.

Sentence:

The kittens frolicked with great enthusiasm on the magenta carpet.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A13

Situation:

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room rug.

Sentence:

The kittens frolicked on the rug with great glee.

How natural or appropriate does the sentence sound?

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A14**Situation:**

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room rug.

Sentence:

The kittens frolicked on the rug with great enthusiasm.

How natural or appropriate does the sentence sound?

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A15

Situation:

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room carpet.

Sentence:

The kittens frolicked on the magenta carpet with great glee.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial A16

Situation:

Joe's cat had a litter of kittens. When they were very young, the kittens stayed in the large basket that Joe provided them, but one day the kittens found their way out of the basket and onto the living-room carpet.

Sentence:

The kittens frolicked on the magenta carpet with great enthusiasm.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B9

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures for over an hour in front of her house.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B10

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures for over an hour in front of her next-door neighbor's house.

How natural or appropriate does the sentence sound?

Very unnatural	Somewhat unnatural	Somewhat natural	Very natural
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B11**Situation:**

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures for almost an entire afternoon in front of her house.

How natural or appropriate does the sentence sound?

Very unnatural	Somewhat unnatural	Somewhat natural	Very natural
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B12

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures for almost an entire afternoon in front of her next-door neighbor's house.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B13

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures in front of her house for over an hour.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B14

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures in front of her house for almost an entire afternoon.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B15

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures in front of her next-door neighbor's house for over an hour.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Adverbial B16

Situation:

Gertrude's aunt gave her a box of sidewalk chalk for her birthday. The next day, she went outside to try out the new chalk.

Sentence:

Gertrude drew pictures in front of her next-door neighbor's house for almost an entire afternoon.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something

like this.

Control 1

Situation:

Susan asked John if he wanted to go clubbing this Friday. John said he didn't feel up to it because his pet harp seal had just passed away.

Sentence:

Susan said she understood why John wanted any time alone this week.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Control 2

Situation:

The family is sitting around the dinner table getting ready to eat when suddenly a knock is heard at the front door.

Sentence:

It seems to be someone is at the door.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Control 3

Situation:

Tom told me at a party that he had a huge crush on Janice. When I saw Janice dancing alone later in the evening, I urged Tom to go dance with her.

Sentence:

Tom said that he wants one more drink before he danced with Janice.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Control 5

Situation:

Tom told me at a party that he had a huge crush on Janice. When I saw Janice dancing alone later in the evening, I urged Tom to go dance with her.

Sentence:

Tom said he wanted one more drink before he danced with Janice.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Control 6**Situation:**

Susan asked John if he wanted to go clubbing this Friday. John said he didn't feel up to it because his pet harp seal had just passed away.

Sentence:

Susan said she understood why John wanted some time alone this week.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, identity A, 2**Situation:**

Justin and Kurt were at the end of the wilderness. Justin hiked all the way to the other side, even though it took him almost a day. Kurt started out with Justin, but he turned back after a couple of hours because he realized that he didn't bring any food.

Sentence:

Justin walked through the wilderness, and so did Kurt.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, identity A, 1**Situation:**

Betty and Kathleen each decided to bake a cake. They put the ingredients on the counter. Betty finished the batter and poured it into the pan. Kathleen had barely started mixing the batter when the phone rang.

Sentence:

Betty mixed the batter, and so did Kathleen.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, contradiction, 2

Situation:

The coffee was cold. Steven only drinks hot coffee. He placed the coffee in the microwave, but there was a power failure after only ten seconds, so the coffee was still cold.

Sentence:

Steven warmed the coffee, but he didn't warm the coffee.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, contradiction, 1

Situation:

Marie decided to bake a cake. First, she had to make the batter, but before she was done, the phone rang.

Sentence:

Marie mixed the batter, but she didn't mix the batter.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, identity B, 1**Situation:**

John and Bill were cleaning the floor, which was really dirty. John started cleaning it, but gave up. Bill worked hard to clean it, and in the end the floor was spotless.

Sentence:

John scrubbed the floor, and so did Bill.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX Telic alternation, identity B, 2**Situation:**

Marie and Paul wanted to drink some coffee. Marie thought that five seconds in the microwave would be enough, but her coffee was still cold when she started to drink it. Paul put his coffee in the microwave for a minute, so it was hot in the end.

Sentence:

Marie warmed her coffee, and so did Paul.

How natural or appropriate does the sentence sound?

Very unnatural	Somewhat unnatural	Somewhat natural	Very natural
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Implicature test, identity, 2**Situation:**

Sean is trying to figure out what dish to prepare for the party. He's trying to find out what people like and what they dislike.

Sentence:

Justin doesn't like garlic and neither does Sue. In fact, Justin hates garlic and Sue is neutral - she neither likes it nor hates it.

How natural or appropriate does the sentence sound?

Very unnatural	Somewhat unnatural	Somewhat natural	Very natural
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Ambiguity test, identity, 2

Situation:

Fred put his hand on the big box and Dan put his hand on the front of his upper body.

Sentence:

Fred touched his chest, and so did Dan.

How natural or appropriate does the sentence sound?

Very unnatural



Somewhat unnatural



Somewhat natural



Very natural

**Rating scale**

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Ambiguity test, identity, 1

Situation:

Joe and Sue live in a city which lies on two sides of a river. Sue went to the river and Joe went downtown to deposit a check.

Sentence:

Joe went to the bank and so did Sue.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Implicature test, identity, 1**Situation:**

It's spring and grass grows very fast. All the lawns on the block must be mowed at least once a week. Sarah wants to earn some money by mowing grass.

Sentence:

If Sarah mows the lawn, Mr Stram pays her 5 dollars and so does Ms Cobb. But Mr Stram pays Sarah only if she mows his lawn; Ms Cobb may pay Sarah even if she does not.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something

like this.

XXX More atelic 1

Situation:

There was a lonely ant living in a yard under an apple tree. One day, an apple fell to the ground. It was much bigger than the ant, so even though the ant nibbled at it, in the end it rotted into the ground.

Sentence:

The ant ate the apple.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX More atelic 2

Situation:

Bill decided to have green walls in his living room instead of the white walls he had had for several years. He had only one can of paint, so he ran out of paint after three hours of painting. He didn't finish a single wall.

Sentence:

Bill painted the wall for three hours.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX More atelic 3**Situation:**

The coffee was very cold. Steven only drinks hot coffee. He heated the coffee in the microwave, but there was a power failure after only ten seconds, so the coffee was still cold.

Sentence:

Steven warmed the coffee for ten seconds.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

XXX More atelic 4

Situation:

Sue decided to see a trail in the forest. She only had a short time to hike, so she covered only a small part of the entire trail.

Sentence:

Sue walked the trail.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyponym, contradiction 1

Situation:

Bill has a large cut on his hand.

Sentence:

Bill has a cut on his finger, but not a finger; it's his thumb.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyonym, contradiction 2

Situation:

Sean drew a four-sided geometric form.

Sentence:

The rectangle is not a rectangle; it's a square.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyponym, identity A, 1

Situation:

Kathleen and Marie were sitting in a bar. Kathleen had a soda and Marie had a shot of vodka.

Sentence:

Kathleen had a drink and so did Marie.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyponym, identity A, 2

Situation:

It looked like both Bill and Sean were carrying a weapon. Bill's weapon was fake, but Sean's was real.

Sentence:

Bill had a gun and so did Sean.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyponym, identity B, 1

Situation:

Mary and Sue both drew a four-sided geometric form. Sue drew a form that had four sides of equal length, but Mary's form did not.

Sentence:

Mary drew a rectangle and so did Sue.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.

Somewhat natural: This sentence sounds ok, although I might not say it this way myself.

Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.

Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Autohyponym, identity B, 2

Situation:

Fred and Dan were sitting in a bar. Fred had a whiskey and Dan a coke.

Sentence:

Fred had a drink and so did Dan.

How natural or appropriate does the sentence sound?

Very unnatural Somewhat unnatural Somewhat natural Very natural

☐ ☐ ☐ ☐

Rating scale

Very natural: This sentence sounds totally fine, and I would likely say it this way as well.
 Somewhat natural: This sentence sounds ok, although I might not say it this way myself.
 Somewhat unnatural: This sentence sounds rather odd; I probably would not ever say it this way.
 Very unnatural: This sentence sounds completely wrong; it's not possible to say something like this.

Ending Questions and Thank-You Block

What is/are your native language(s)? (What language(s) have you heard and used since birth?) Please include all such languages and include any relevant comments (e.g. I have learned Hindi until I was six; I have not used Hindi since then).

Please list any other language(s) you speak or have learned. Please indicate your level of familiarity with that language as well (beginner, intermediate, advanced).

Please include any comments or questions you have in connection with the sentences you rated during this study.

Thank you for your participation in this study! The purpose of this study is to examine the ordering of adverbials (adverbs and other elements of a sentence that take similar roles) in English. If you have any questions or concerns about this study, please contact Christina Yong at cmy1 (at) utah (dot) edu or Dr. Aniko Csirmaz at aniko (dot) csirmaz (at) utah (dot) edu. You may also contact the University of Utah IRB at irb@hsc.utah.edu if you have questions about your rights as a research participant. Please proceed to the next page to finish the questionnaire.

APPENDIX C

STATISTICAL METHODS

Greg Stoddard

Co-Director, University of Utah Study Design and Biostatistics Center

Adjunct Associate Professor, Dept of Family and Preventive Medicine

Division of Epidemiology, University of Utah School of Medicine

295 Chipeta Way Rm 1N433, Salt Lake City UT 84132

Phone: 801-213-3774 Fax: 801-581-3623 Email: greg.stoddard@hsc.utah.edu

Statistical Methods

The sentence structure groups were formed by permutations of type (locative, manner, durative) and length (short, long), so $3 \times 2 = 6$ permutations for first position (came first), which could be permuted with $3 \times 2 = 6$ permutations in the second position (came second). Thus there were $6 \times 6 = 36$ possible permutations. In the dataset, 16 of these possible permutations were studied. Each study subject was provided 2 sentences from each of the 16 groups, so 26 sentences per study subject. The sample size was $16 \text{ groups} \times 13 \text{ study subjects} \times 2 \text{ sentences} = 416 \text{ total sentences}$.

The outcome variable was grammaticality, scored as (1 = very unnatural, 2 = somewhat unnatural, 3 = somewhat natural, and 4 = very natural), representing an ordered categorical, or ordinal scaled, variable. The statistical analysis treated the outcome as an ordinal scale. The simple statistical approach for an ordinal scaled outcome is the Wilcoxon rank sum test if two independent groups are being compared, with each study subject scoring a single sentence, or with the Wilcoxon signed rank test if the data are a matched sample, such as a single sentence scored in both pre-test and post-test score by the same study subject. The data did not represent either of these two study designs, so a simply analysis was not possible.

The data had a multilevel, or clustered, structure, with sentences nested within study subject, with no natural pairing of a sentence with any other sentence. For statistical analysis, then, a mixed effects ordinal logistic regression model was used. The “ordinal logistic” feature comes from the fact that an ordinal scale outcome was being model. The “mixed effects” feature comes from the fact that sentences were nested within study subjects, requiring the model to account for this lack of independence among the sentences, as well as to make comparisons using a within subjects fashion. In the model, the grammaticality score was the outcome variable. The predictor variable was group, using 15 indicator variables to model the 16 groups. To allow for comparisons of a specific group to the other groups, the reference group was varied by leaving the indicator variable for that specific group out of the model. The model output, then, was 15 rows, each row representing a specific group, and the p values represented comparisons of those 15 groups to the omitted (referent) group. The exponentiated regression coefficients in this type of model represent the odds of moving to the next higher score on the outcome variable, which are not of any particular interest. However, the significance test that goes with the regression coefficients represents a statistical comparison of one group having higher scores than another group, similar to the ordinary Wilcoxon test approach, which is exactly the test of interest.

APPENDIX D

ADVERBIAL RELATIONSHIPS

Relationships

~~

Sloc Sman

> Lloc Lman = evidence for relative unmarkedness of shorter constructions

< Sloc Sdur

< Sloc Ldur

< Lloc Sdur

< Sdur Sloc

< Sdur Lloc

< Ldur Sloc

< Ldur Lloc

~~

Sloc Lman

> Lloc Lman = a) evidence for relative unmarkedness of shorter constructions;
and/or b) evidence for short-long order

< Sloc Sdur

< Sloc Ldur

< Lloc Sdur

< Sdur Sloc

< Sdur Lloc

< Ldur Sloc

< Ldur Lloc

~~

Sloc Sdur

> Sloc Sman

> Sloc Lman

> Sloc Ldur = a) evidence for relative unmarkedness of shorter constructions;
and/or

b) evidence against short-long order

> Lloc Sman

> Lloc Lman

> Lloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
and/or

b) evidence against long-short order

> Lloc Ldur = evidence for relative unmarkedness of shorter constructions

> Sman Sloc

> Sman Lloc

> Lman Sloc

> Lman Lloc

> Sdur Sloc = evidence for locative-durative order

> Sdur Lloc = a) evidence for relative unmarkedness of shorter constructions;
and/or

b) evidence for locative-durative order; and/or

c) evidence against short-long order

-in this case the evidence elsewhere for short-long order and

locative- durative order makes it seem likely that this example
should also be interpreted as evidence for locative-durative
order> Ldur Sloc = a) evidence for relative unmarkedness of shorter constructions;
and/or

b) evidence against long-short order; and/or

c) evidence for locative-durative order

> Ldur Lloc = a) evidence for relative unmarkedness of shorter constructions;
and/or

b) evidence for locative-durative order

~~

Sloc Ldur

> Sloc Sman

> Sloc Lman

> Lloc Sman

> Lloc Lman

```

> Sman Sloc
> Sman Lloc
> Lman Sloc
> Lman Lloc

< Sloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence against short-long order
~~
Lloc Sman
> Lloc Lman = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence for long-short order

< Sloc Sdur
< Sloc Ldur
< Lloc Sdur
< Sdur Sloc
< Sdur Lloc
< Ldur Sloc
< Ldur Lloc
~~
Lloc Lman
< Sloc Sman = evidence for relative unmarkedness of shorter constructions
< Sloc Lman = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence for short-long order

< Sloc Sdur
< Sloc Ldur
< Lloc Sman = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence for long-short order

< Lloc Sdur
< Lloc Ldur
< Sman Sloc = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence for manner-locative order
< Sman Lloc = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence for short-long order; and/or
                c) evidence for manner-locative order

< Sdur Sloc
< Sdur Lloc
< Ldur Sloc
< Ldur Lloc
~~
Lloc Sdur
> Sloc Sman
> Sloc Lman
> Lloc Sman
> Lloc Lman
> Sman Sloc
> Sman Lloc
> Lman Sloc
> Lman Lloc

< Sloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
                and/or
                b) evidence against long-short order
~~
Lloc Ldur
> Lloc Lman
> Lman Sloc

```

```

> Lman Lloc

< Sloc Sdur = evidence for relative unmarkedness of shorter constructions
~~~
Sman Sloc
> Lloc Lman = a) evidence for manner-locative order; and/or
               b) evidence for relative unmarkedness of shorter constructions
> Lman Sloc = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for short-long order
> Lman Lloc = evidence for relative unmarkedness of shorter constructions

< Sloc Sdur
< Sloc Ldur
< Lloc Sdur
< Sdur Sloc
~~~
Sman Lloc
> Lloc Lman = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for manner-locative order; and/or
               c) evidence for short-long order
> Lman Sloc = evidence for short-long order
> Lman Lloc = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for short-long order

< Sloc Sdur
< Sloc Ldur
< Lloc Sdur
< Sdur Sloc
~~~
Lman Sloc
< Sloc Sdur
< Sloc Ldur
< Lloc Sdur
< Lloc Ldur
< Sman Sloc = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence against long-short order
< Sman Lloc = evidence for short-long order
< Sdur Sloc
< Sdur Lloc
< Ldur Sloc
< Ldur Lloc
~~~
Lman Lloc
< Sloc Sdur
< Sloc Ldur
< Lloc Sdur
< Lloc Ldur
< Sman Sloc = evidence for relative unmarkedness of shorter constructions
< Sman Lloc = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for short-long order

< Sdur Sloc
< Sdur Lloc
< Ldur Sloc
< Ldur Lloc
~~~
Sdur Sloc
> Sloc Sman
> Sloc Lman

```

```

> Lloc Sman
> Lloc Lman
> Sman Sloc
> Sman Lloc
> Lman Sloc
> Lman Lloc

< Sloc Sdur = evidence for locative-durative order
~~
Sdur Lloc
> Sloc Sman
> Sloc Lman
> Lloc Sman
> Lloc Lman
> Lman Sloc
> Lman Lloc

< Sloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for locative-durative order; and/or
               c) evidence against short-long order
-in this case the evidence elsewhere for short-long order and
locative-durative order makes it seem likely that this example
should also be interpreted as evidence for locative-durative order
~~
Ldur Sloc
> Sloc Sman
> Sloc Lman
> Lloc Sman
> Lloc Lman
> Lman Sloc
> Lman Lloc

< Sloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence against long-short order; and/or
               c) evidence for locative-durative order
~~
Ldur Lloc
> Sloc Sman
> Sloc Lman
> Lloc Sman
> Lloc Lman
> Lman Sloc
> Lman Lloc

< Sloc Sdur = a) evidence for relative unmarkedness of shorter constructions;
               and/or
               b) evidence for locative-durative order
~~~~

Summary:

3.3136
Sloc Sman > Lloc Lman: evidence for relative unmarkedness of shorter
               constructions

3.296024
Sloc Lman > Lloc Lman: a) evidence for relative unmarkedness of shorter
               constructions; and/or
               b) evidence for short-long order

```

10.93353

Sloc Sdur > Sloc Ldur: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence against short-long order

11.75036

Sloc Sdur > Lloc Sdur: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence against long-short order

29.13551

Sloc Sdur > Lloc Ldur: evidence for relative unmarkedness of shorter constructions

11.16748

Sloc Sdur > Sdur Sloc: evidence for locative-durative order

24.73914

Sloc Sdur > Sdur Lloc: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for locative-durative order; and/or
c) evidence against short-long order

25.46352

Sloc Sdur > Ldur Sloc: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence against long-short order; and/or
c) evidence for locative-durative order

22.4321

Sloc Sdur > Ldur Lloc: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for locative-durative order

3.552157

Lloc Sman > Lloc Lman: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for long-short order

5.589962

Sman Sloc > Lloc Lman: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for manner-locative order

4.264839

Sman Lloc > Lloc Lman: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for short-long order; and/or
c) evidence for manner-locative order

4.040647

Sman Sloc > Lman Sloc: a) evidence for relative unmarkedness of shorter constructions; and/or
b) evidence for short-long order

4.339075

Sman Sloc > Lman Lloc: evidence for relative unmarkedness of shorter constructions

3.082795

Sman Lloc > Lman Sloc: evidence for short-long order

3.31048

Sman Lloc > Lman Lloc: a) evidence for relative unmarkedness of shorter
constructions; and/or
b) evidence for short-long order

REFERENCES

- ABELS, KLAUS. 2003. Successive cyclicity, anti-locality, and adposition stranding. PhD dissertation, University of Connecticut.
- ADGER, DAVID, and GEORGE TSOULAS. 2004. Circumstantial adverbs and aspect. *Adverbials: The interplay between meaning, context, and syntactic structure*, ed. by Stefan Engelberg, Jennifer R. Austin, and Gisa Rauh, 45-66. Amsterdam: John Benjamins Publishing Company.
- ALEXIADOU, ARTEMIS. 1997. *Adverb placement: A case study in antisymmetric syntax*. Amsterdam: John Benjamins Publishing Company.
- BISKUP, PETR. 2011. *Adverbials and the phase model*. Amsterdam: John Benjamins Publishing Company.
- BOWERS, JOHN. 1993. The syntax of predication. *Linguistic Inquiry* 24.591-656.
- CHOMSKY, NOAM. 1981. *Lectures on government and binding*. Berlin: Mouton de Gruyter.
- CHOMSKY, NOAM. 1995. *The Minimalist program*. Cambridge, MA: MIT Press.
- CHOMSKY, NOAM. 2001. Derivation by phase. *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 1-52. Cambridge, MA: The MIT Press.
- CINQUE, GUGLIELMO. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. New York: Oxford University Press.
- CINQUE, GUGLIELMO. 2004. Issues in adverbial syntax. *Lingua* 114.683-710.
- COWART, WAYNE. 1997. *Experimental syntax: Applying object methods to sentence judgments*. Thousand Oaks, CA: SAGE Publications.
- CULBERTSON, JENNIFER, and STEVEN GROSS. 2009. Are linguists better subjects? *British Journal for the Philosophy of Science* 60(4).721-736.
- CULICOVER, PETER, and MICHAEL ROCHEMONT. 1990. Extraposition and the complement principle. *Linguistic Inquiry* 21.23-48.

- DARLING, CHARLES. 1996-2005. *Adverbs*. Retrieved from <http://grammar.ccc.commnet.edu/grammar/adverbs.htm>
- DAVIDSON, DONALD. 1967. The logical form of action sentences. *The logic of decision and action*, ed. by Nicholas Rescher, 81-95. Pittsburgh, PA: University of Pittsburgh Press.
- DIESING, MOLLY. 1992. *Indefinites*. Cambridge, MA: The MIT Press.
- ERNST, THOMAS. 2002. *The syntax of adverbials*. West Nyack, NY: Cambridge University Press.
- ERNST, THOMAS. 2003. Adjuncts and word order asymmetries. *Asymmetry in grammar, volume 1: Syntax and semantics*, ed. by Anna Maria Di Sciullo, 187-207. Amsterdam: John Benjamins Publishing Company.
- ERNST, THOMAS. 2004. Principles of adverbial distribution in the lower clause. *Lingua* 114.755-777.
- HALE, KENNETH, and SAMUEL J. KEYSER. 1993. *On argument structure and the lexical expression of syntactic relations*. Cambridge, MA: MIT Press.
- HUDDLESTON, RODNEY D., and GEOFFREY K. PULLUM. (2002). *The Cambridge grammar of the English language*. New York: Cambridge University Press.
- KAYNE, RICHARD S. 1994. *The antisymmetry of Syntax*. *Linguistic Inquiry Monograph* 25. Cambridge, MA: MIT Press.
- LAENZLINGER, CHRISTOPHER. 2002. A feature-based theory of adverb syntax. *Generative grammar in Geneva* 3.67-106.
- MCCONNELL-GINET, SALLY. 1982. Adverbs and logical form: A linguistically realistic theory. *Language* 58(1).144-184.
- MÜLLER, GEREON. 2004. Argument encoding and the order of elementary operations. IDS Mannheim, MS. Online: <http://www.uni-leipzig.de/~muellerg/mu56.pdf>
- NILSEN, ØYSTEIN. 2000. *The syntax of circumstantial adverbials*. Oslo: Novus Press.
- NILSEN, ØYSTEIN. 2004. Domains for adverbs. *Lingua* 114.809-847.
- PARSONS, TERENCE. 1990. *Events in the semantics of English: A study in subatomic semantics*. Cambridge, MA: MIT Press.
- PESETSKY, DAVID, and ESTHER TORREGO. 2001. T-to-C movement. *Ken Hale: A life in language*, ed. by Michael Kenstowicz, 355-426. Cambridge, MA: The MIT Press.

- PESETSKY, DAVID, and ESTHER TORREGO. 2007. The syntax of valuation and the interpretability of features. *Phrasal and clausal architecture: Syntactic derivation and interpretation*, ed. by Simin Karimi, Vida Samiian, and Wendy K. Wilkins, 262-294. Amsterdam: John Benjamins Publishing Company.
- POLLOCK, JEAN-YVES. 1989. Verb movement, universal grammar, and the structure of IP. *Linguistic Inquiry* 20.365–525.
- QUALTRICS. 2015. Qualtrics Research Suite (version 2013) [software]. Accessed through <https://humutah.col.qualtrics.com/WRQualtricsControlPanel/>
- QUIRK, RANDOLPH; SIDNEY GREENBAUM; GEOFFREY LEECH; and JAN SVARTVIK. 1985. *A comprehensive grammar of the English language*. New York: Longman.
- ROCHEMONT, MICHAEL, and PETER CULICOVER. 1990. *English focus constructions and the theory of grammars*. Cambridge, UK: Cambridge University Press.
- SCHÜTZE, CARSON T., and JON SPROUSE. 2011. Judgment data. *Research methods in linguistics*, ed. by Robert J. Podesva and Devyani Sharma, 27-50. New York: Cambridge University Press.
- WASOW, THOMAS. 1997. Remarks on grammatical weight. *Language Variation and Change* 9.81-105.
- WILLIAMS, EDWIN. 2013. Generative semantics, generative morphosyntax. *Syntax* 61(1).77-108.